Trains

April
1945

25¢

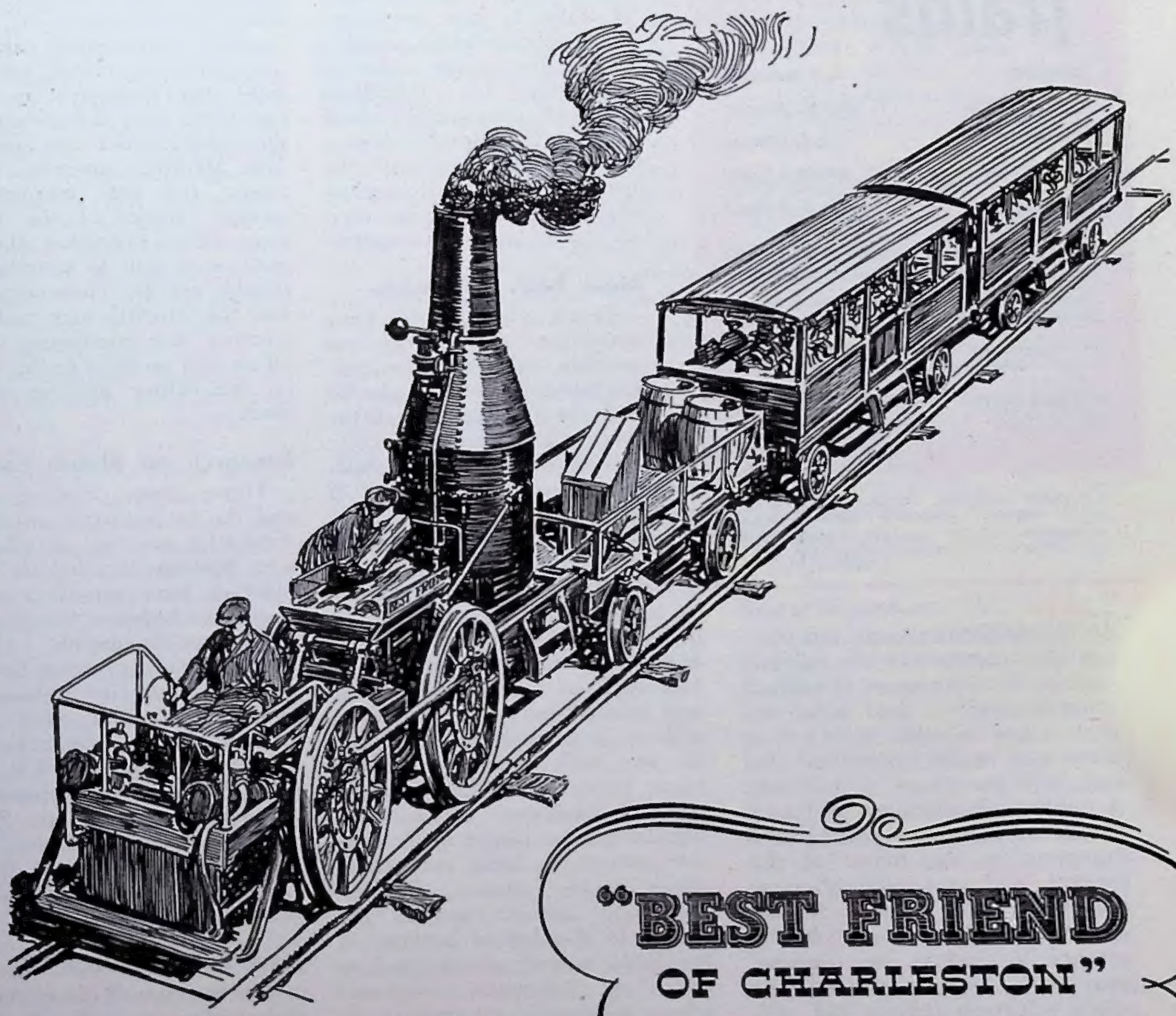
The Sign of a Good Neighbor

C&EI—The CHICAGO Line—is a friendly connection in the system of American carriers. Through three southern gateways, its lines are the most direct between Chicago and many points in the great Southland. Centrally located, it strives to serve as a good neighbor.

The spirit of neighborliness is present in all traffic interchanges. It enters into the relationship between the **C&EI** and the markets, industries, mines and farms for which it is a vital artery of transportation. It reaches into the South, to bring into closer contact the peoples of Dixieland with those of the North, of which Chicago is the hub. It reflects the attitude of the **C&EI** organization in the war effort—twice winner of the Victory Garden Award for cooperation with the War Food Administration.

Neighborliness is an element of service. It will be a plus factor of helpfulness in the progressive plans being prepared by the **C&EI** for postwar development.

CHICAGO & EASTERN ILLINOIS RAILROAD



"BEST FRIEND OF CHARLESTON"

MORE than a hundred years ago, perky little "Best Friend of Charleston" chugged proudly over the longest stretch of railroad in the world... the 136 miles between Charleston and Hamburg, South Carolina, now a part of the Southern Railway System.

Now, the South... and all America... reaps a rich reward from this historic achievement.

You can see it in the sleek giants that pull war-busy passenger trains out of bustling Southern Railway stations.

You can hear it in the rumble of powerful freight locomotives that speed Southern trains with the vital weapons of war.

Yes... the transportation services started by 1830's "Best Friend" are today the best friend of the farmer... the business man... the worker... the fighting man... the best friend of all who work and pray for Victory.

And when that bright day comes, there will be other important jobs for modern "Best Friends" to do. For a Southland abounding in energy and initiative... unbelievably rich in natural wealth... steadily expanding in agriculture, industry and commerce... will be needing the efficient, dependable transportation service of the 8,000-mile Southern Railway System.

Ernest E. Norris

President

THE SOUTHERN SERVES THE SOUTH

SOUTHERN RAILWAY SYSTEM

Trains

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American railroads produce the world's most efficient common-carrier mass transportation and are the foundation of our country's industrial productivity.

INTERESTING though the physical characteristics of the railroads may be, the economics of railroad transportation is far more important and in some ways just as interesting as the appearance, the feel, and the sound of railroads. A public understanding of fundamental transportation economics is important to the future of this country, and as a publication on railroads for the layman, TRAINS would be sadly lacking if it did not try to explain, on occasion, some of the ways in which public policy adversely affects the railroads. Our remarks of this type come from a profound personal conviction that if the friends of the railroads wish to continue to have railroads to ride upon and to look at they'd better not only like the railroads but know *why* railroads are important.

Every step by which subsidies deprive the railroads of traffic which they could handle with greater real efficiency also deprives the railroads of revenue which could be used to improve our railroad network. Not only that, but any such subsidy juggling increases the country's total transportation bill out of proportion to value received. Every step, on the contrary, to use our country's transportation resources most efficiently, each for its own best purpose, helps to increase our standard of living.

We would be the last to ever claim that the railroads are capable of handling every kind of traffic to best advantage, but thousands of tons are moving in this country today on competing tax subsidized means of transportation which would go by railroad if all rates reflected true total cost. We certainly owe it to ourselves and our country to do what we can to right this situation.

New B&M Timetable

People who for years have maintained that no one can possibly understand a railroad timetable will be pleased with the new timetable of the Boston & Maine, an entirely new departure in both typography and arrangement of schedules. It is the result of more than two years research by a group of typographical experts headed by Professor Ray Nash of Dartmouth. The traditional gothic timetable type has been discarded for a very legible face such as used in advertising and publication work. The page makeup is much more inviting to the eye, with elimination of the many heavy lines which used to separate schedules. Mileage figures have been placed in the outside column, to bring train times closer to the stations. Connections and through services are shown in the logical position in the table instead of relegated to the rear. Reference notes and other incidental information is readily found close to the schedule affected. The folder is finished by a back page of cartoons showing how to use the timetable, an idea similar to newspaper advertisements run by the B&M last July.

About New Passenger Cars

The two Diesel-driven seven-car streamlined trains which the Pere Marquette has on order will be used for a proposed six-trip daily service between Detroit, Lansing, and Grand Rapids. One of the westbound streamliners will provide a suitable connection at Detroit for passengers arriving on Pennsylvania Railroad's *Red Arrow*, the B&O *Ambassador* and the C&O *Sportsman*, all of which use the Fort Street Union Station along with Pere Marquette.

The six stainless-steel coaches ordered by Minneapolis & St. Louis will be used as trailers behind gas-electric cars on the three passenger routes operated by the road. Since M&StL is not essentially a passenger carrier and has only local service, much curiosity was displayed by railroad people all over the country when the M&StL order was announced. The M&StL, however, sees no reason for not improving this service. Critics of the railroads have often suggested that local services as well as mainline trains should get fine new equipment, and the M&StL may well prove whether new equipment will pay off as well on local trains as it has on the deluxe limiteds of other roads.

Research on Steam Locos

Three major coal companies and the six railroads which originate 61.8 per cent of all bituminous tonnage handled by Class 1 railroads have started a research project to improve the coal-burning steam locomotive. Although important improvements have been made recently by railroads and manufacturers and other designs are under active study, the existing developments will not be duplicated by the new project. The six railroad sponsors are: Pennsylvania, Baltimore & Ohio, Norfolk & Western, Chesapeake & Ohio, Louisville & Nashville, and New York Central.

New Banana Dock

The Southern Railway has completed plans to restore and modernize its Charleston, S. C., Cooper River pier and banana handling facilities which were destroyed by fire last fall. How soon the work will be finished depends upon the Southern's success in getting W. P. B. approval and also in purchase of materials for work. Covered island loading platforms with a capacity of 36 cars will be built.

Odds and Ends

Twenty-five 4-8-4 steam locomotives of not less than 6000 horsepower each have been ordered by the New York Central for 1945 delivery from Alco. They will be similar to the experimental locomotive now being built, and will have extra large tenders carrying 46 tons of coal and 18,000 gallons of water . . . *Railway Age* computes that there is more horsepower of Diesel locomotives in Class 1 road service than in switch-

ing. It lists 505 locomotives totaling 1,668,240 horsepower in road service and 2,010 locomotives of 1,610,438 horsepower in switching service. Slightly over one million horsepower of the road locomotives are freight, the balance passenger or dual service . . . The C&O has ordered 10 4-8-4 steam locomotives from Lima Locomotive Works. . . . The I.C.C. has ordered the Atlantic Coast Line to show cause why it should not install block signaling on specific sections of line totaling 2100 miles.

The Chicago Rapid Transit has ordered two two-car trains of new design, one each from Pullman-Standard and St. Louis Car Co. . . . Motor capital Detroit has included $28,000,000 worth of new street railway equipment in its postwar plans for municipal transit improvements. A huge underground plaza on Woodward Ave. with 18 entrances to reach six street railway routes is also proposed. . . . Premier John Hart of British Columbia plans to sell the province-owned Pacific Great Eastern [December 1944 TRAINS] jointly to Canadian National and Canadian Pacific and this complicates American postwar plans to build an Alaskan railroad in which the PGE would be a vital link. . . . The first railroad ticket to Berlin to be issued an American soldier, taken when Aachen fell early in the winter, was recently presented to Major General Frank Ross, chief of the transportation corps in the European theater, in a ceremony at an important Belgium center. . . . The Rock Island has ordered 10 4-8-4 steam locomotives from the American Locomotive Company and the Milwaukee Road is also ordering 10 4-8-4's from the same builder.

What's Become of—

New England's first two streamlined trains, the three-car, two-ended, *Comet* of the New Haven and the three-car Zephyr-like unit of the Boston & Maine which used to run as the *Flying Yankee*, both developed too much business for their seating capacity and were transferred to lesser runs. When it was purchased in 1935 the B&M unit was put on the *Flying Yankee's* run between Boston and Portland, later extended to Bangor over the Maine Central. It built up so much traffic that its limited seating capacity, 132, was too small for this run and for the past three summers it has been renamed the *Mountaineer* and operated between Boston and the White Mountains. For two winters it operated on an abbreviated schedule between Boston and Portland, but again it built up too much traffic and this winter it was renamed the *Cheshire* and now runs between Boston and White River Junction, Vt.

The *Comet* which started life on the Boston-Providence run in 1935, suffered a similar fate. Its seating capacity was inadequate for the traffic it attracted on this potentially busy run and it is now operating in local shuttle service in the Braintree, Mass., area.

CRR of Pennsylvania

The Jersey Central has asked permission of the federal court to lease its Pennsylvania properties to a wholly owned subsidiary, the Central Railroad of Pennsylvania. No changes in service would be made, but the entire Pennsylvania operations would be carried on by the Pennsylvania company, and it would also collect its own passenger and freight charges, with the usual interline divisions for traffic interchanged with the Jersey lines. Reason for proposed change is that the Jersey Central makes most of its money on its Pennsylvania coal traffic, and yet the road is taxed by New Jersey according to the proportion of its mileage in that state. This large mileage is relatively unprofitable, much of its consisting of expensive terminals, and the CNJ has had much expensive and protracted litigation with the state. The new arrangement would make more definite the division of earnings according to states and would forestall if not eliminate litigation in the future.

RGS May Abandon

The scenicly picturesque narrow-gauge Rio Grande Southern, line of the Galloping Geese, may be forced to abandon. It furnishes the only transportation service in a large mining and wool producing area of southwestern Colorado, and efforts are being made to postpone installments due on a Defense Supplies Corporation loan which earlier in the war kept the road alive. In its 171 miles the RGS crosses the summits of three mountain divides. [See February 1942 TRAINS.]

More Burlington CTC

A new 142-mile installation of centralized traffic control on the Burlington from McCook, Neb., to Akron, Colo., will soon complete C.T.C. on the entire 475-mile line from Lincoln to Denver and will give the road either double track or C.T.C. all the way from Chicago to Denver. The Q installed 105 miles of C.T.C. between Denver and Akron in 1937, then the longest such installation in the country, and is nearly finished with a 228-mile installation between Lincoln and McCook.

A. C. Kalmbach.

April, 1945 Volume 5 Number 6

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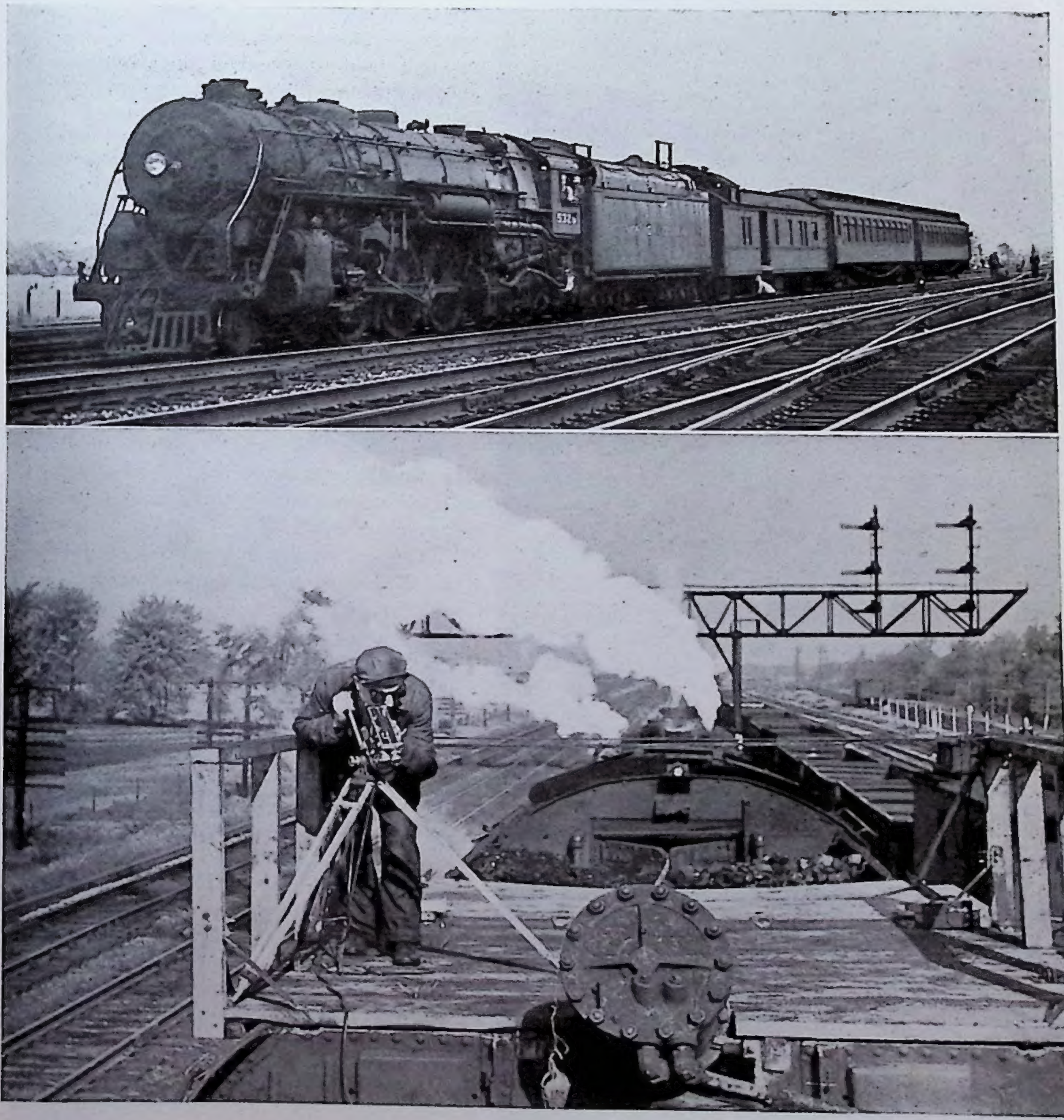
High-Speed Water Scoop

Slow-motion pictures help NYC cure difficulties of taking water at 80 miles per hour

A test train taking water at high speed from a track pan and purposely overflowing tender to obtain motion pictures of water action. The object of good scoop design is to spill as little water on the roadbed and deliver as much in the tank as possible. Lunar white signal lights indicate ends of track tank. Below, overflow vents were redesigned on newly built tenders to dispose of excess water close to rail level. Here a Mohawk L-4b takes water without spraying overflow on adjacent tracks.

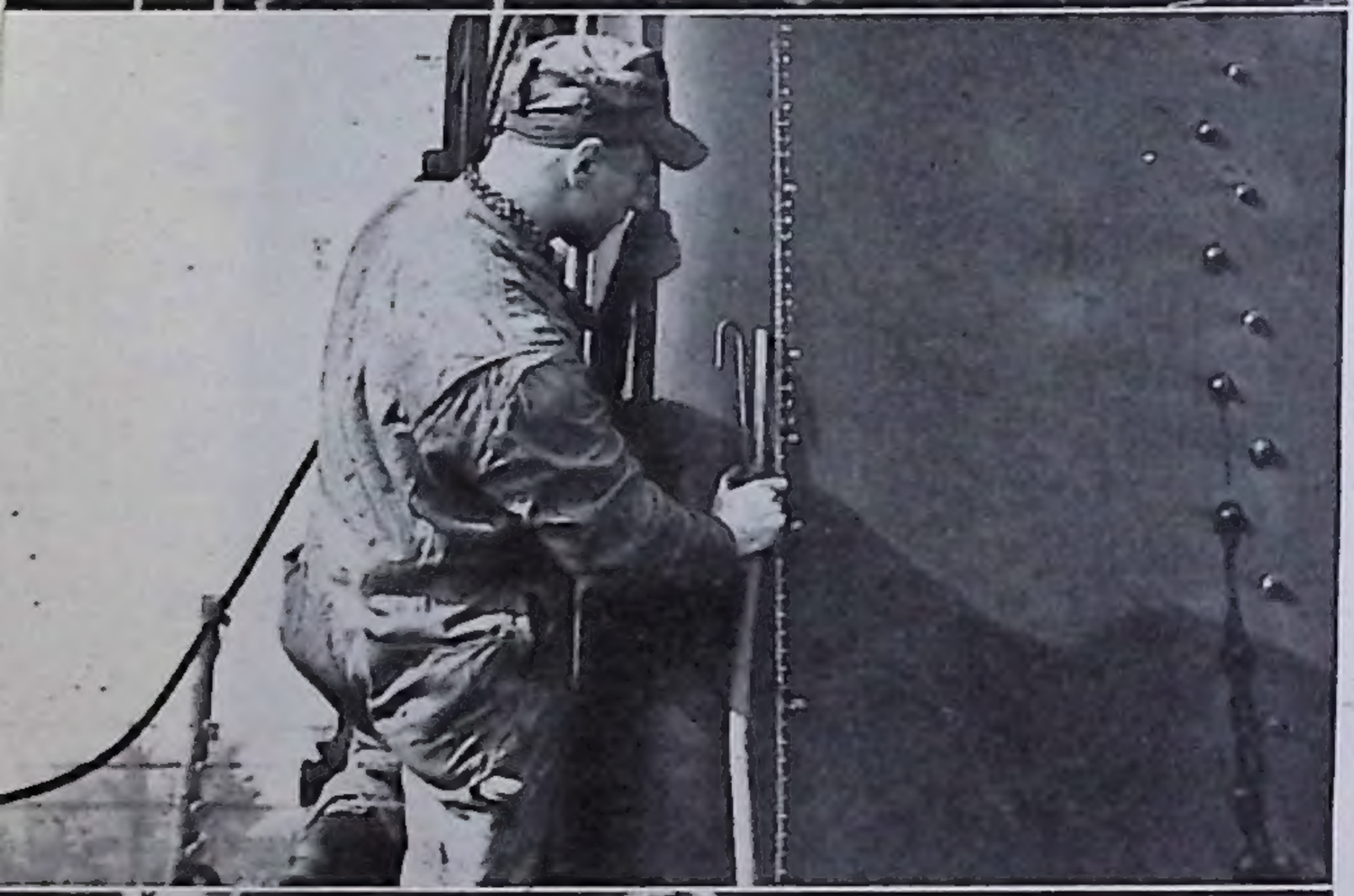
For well over half a century, track pans from which water is scooped on the fly have helped eastern railroads, including New York Central, maintain faster schedules. But in the 1930's, New York Central found passenger trains were losing too much time slowing down from the 80 m. p. h. which had become almost standard running speed to the less than 60 m. p. h. necessary to scoop water. The standard water scoop functioned best at 45 m. p. h., and at too high a speed the scoop mechanism was relatively inefficient.

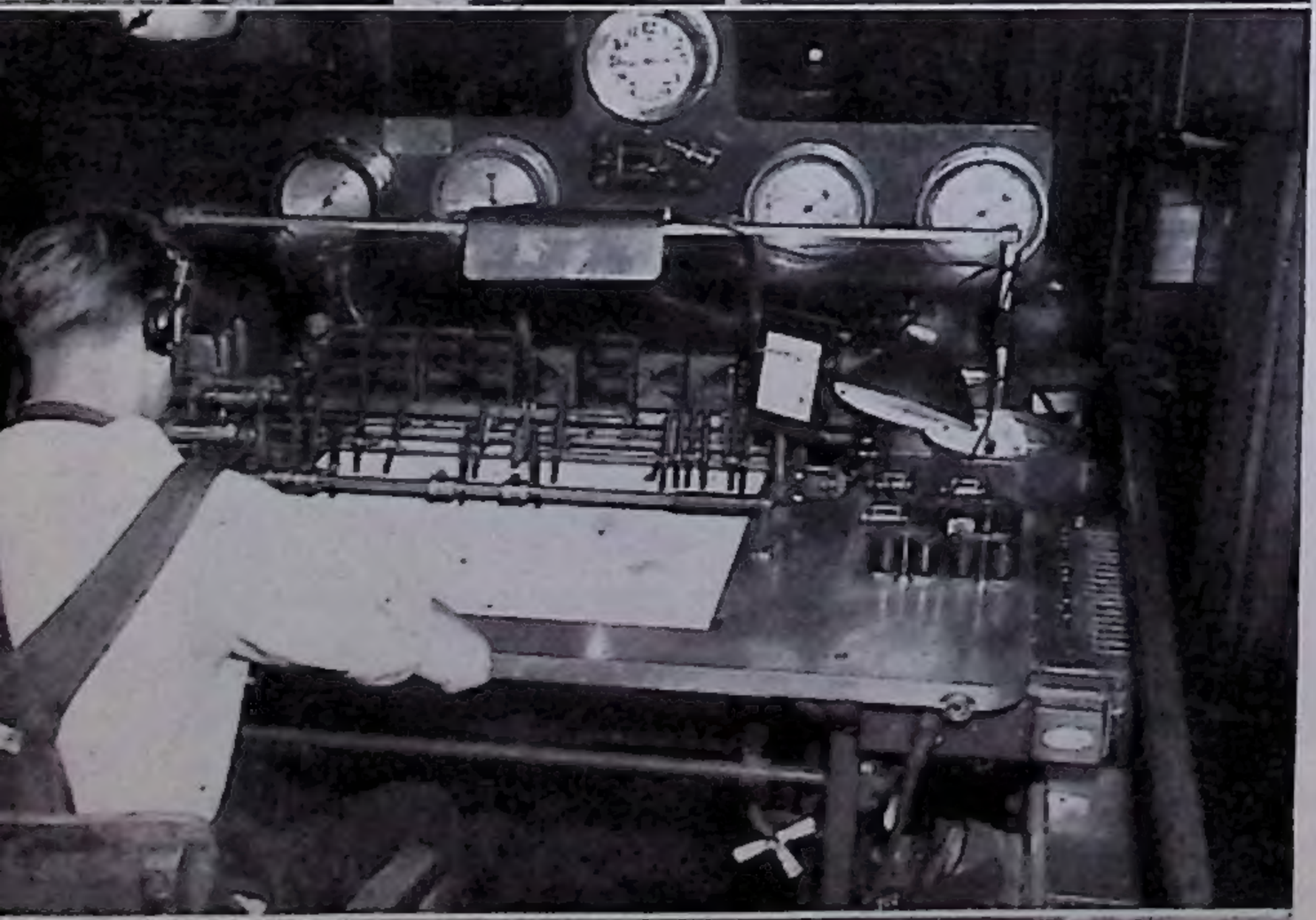
A new, more gently sloped, scoop was developed and comparative tests were made in 1939. The new scoop developed its best efficiency at 75 m. p. h. At a 2000-foot track pan with water scooping distance of 1700 feet, it put nearly 7200 gallons into the tender tank at 75 m. p. h. This was nearly half again as much as could be scooped at the same speed with the old scoop, and there was less than half as much spillage.



This is the test train. First car is dynamometer car, used as headquarters by test crew. Coaches are simply to simulate normal service conditions. Tests were run at pans near Rome, N. Y., and test train spent much time on freight tracks waiting for high-speed passenger tracks to be clear. Lower picture, this is the way the moving picture camera was mounted to take slow motion pictures of water action on tank top. Guarded lamp bulb was lighted when scoop was down taking water. Cameraman had no easy ride on high platform at 80 miles per hour.

Locomotives equipped with these new scoops took water at speeds up to 80 miles per hour, but something about the action caused occasional reports of broken windows on trains which passed on the next track while water was being taken. The whole process happened too fast for observation. Someone had the idea of taking slow motion pictures of the top of the tender tank during water scooping, and the NYC's movie supervisor, who usually spends his time taking movies of railroad operations for public relations purposes, set up a platform over the coal space of Hudson type locomotive No. 5328, which had been





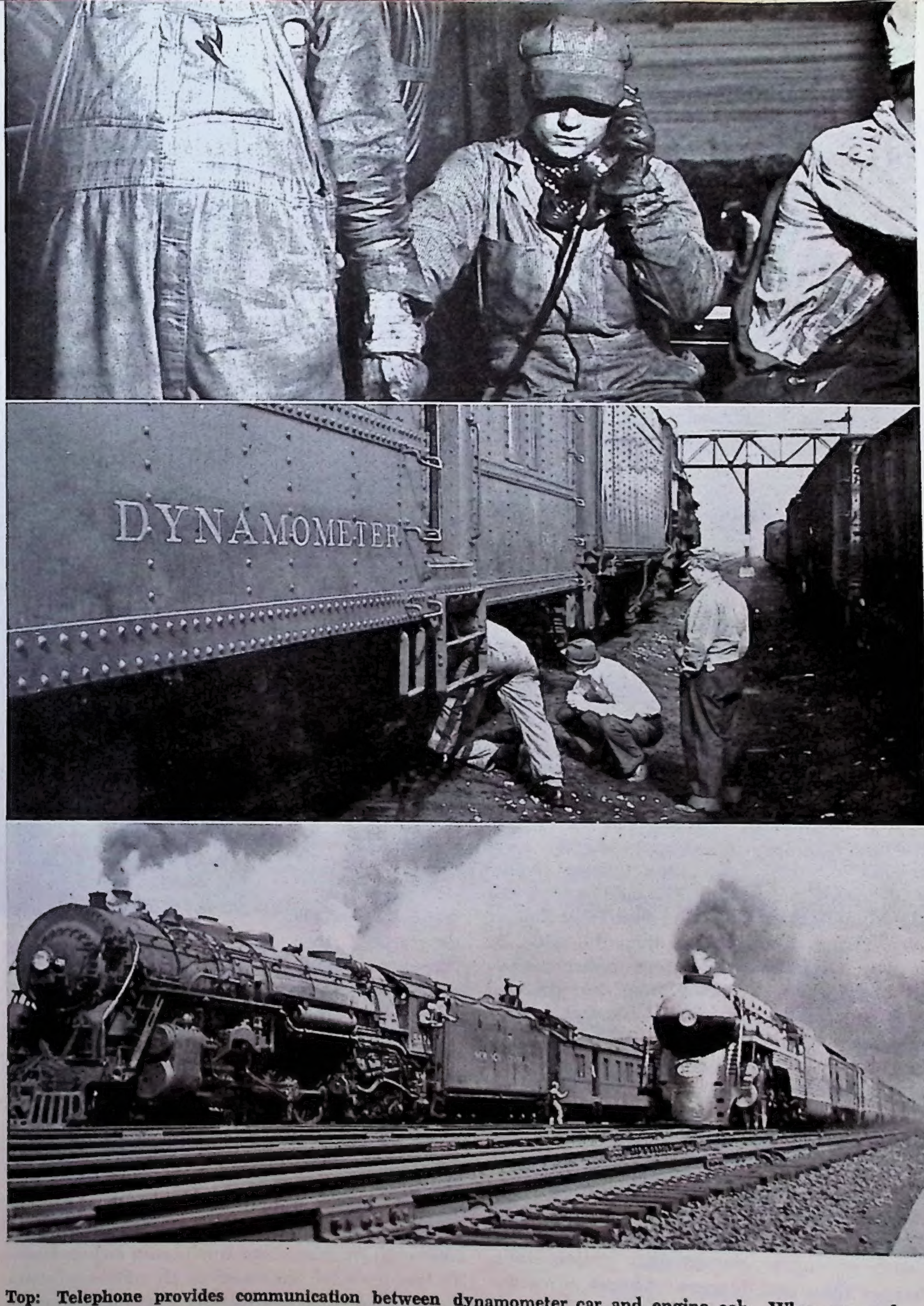
Dynamometer car has cupola for observation purposes. Besides test recording machine, interior includes workshop for repairs and changes of test equipment and living quarters for crew. Water level in tender tank is measured by hose against scale. In usual steam locomotive tests, water consumption is an important segment of test data.

assigned for the tests. The movie camera, mounted on a tripod, was pointed downward at the water hatch.

Test runs were made at all speeds from 45 m. p. h. up to 80 m. p. h. When the resulting films were projected, all the water action on top of the tank was stretched out over several minutes instead of seconds and the mechanical department men could analyze the trouble. The runs were purposely started with a two-thirds full tank so as to duplicate the worst condition, that when a scoop is left down too long and the tank fills to overflowing. In some cases the water came up so hard against the hatch cover that it broke the hasp and bent the heavy reinforced cover itself. In all cases of excessive pickup at high speed, the top of the tank back of the coal space was soon filled with water which splashed over the sides in waves of sufficient force to account for the damage being reported.

Larger and more effective vents were installed to relieve the excessive pressure against the top of the cistern, and more overflows were built leading down through the bottom of the tender frame. The new L-4b Mohawk locomotives were equipped this way by the builder, all the new high capacity tenders now being built have this arrangement, and older locomotives are being equipped in the West Albany shops.

Wide roll of paper is fed through recording machine which makes continuous ink lines to show speed, train line and brake pipe pressure, drawbar pull, steam pressure, and breaks in lines to indicate landmarks, distance time, foot-pounds of work accomplished at the drawbar, coal consumption, and other information. During track pan tests only facts needed were speed, location, time of scoop down and up, and water contents of tank before and after each test. Charts can be spread out on long table along side of car for computations and checking of data.



Top: Telephone provides communication between dynamometer car and engine cab. When steam locomotives are under test, changes of boiler pressure, throttle position, valve cutoff and other such items are reported to test engineers. Center: Of course, whenever railroad men get together they talk about the railroad, and if their own work is talked out, test engineers find some other engineering problems to discuss. Here the water scooping test crew talk over riding qualities of car trucks during wait for a clear main line. Below: No. 51, the Empire State Express, hikes by and then there'll be nearly two hours of clear time for test runs on the No. 1 westbound passenger track before No. 5, the Mohawk, is due.

Riding the West Wind

BY A. C. KALMBACH

Each Twin Zephyr covers 874 miles daily, including world's fastest scheduled run and 600 miles along the Mississippi

THE *Twin Zephyrs* of the Burlington between Minneapolis and Chicago are familiar trains on the American scene. They've been making that run for ten years this month, and you know that No. 21, the *Morning Zephyr*, makes the world's fastest scheduled speed, 84.6 miles per hour, by covering the 55 miles from East Dubuque to Prairie du Chien in 39 minutes. You know that the Chicago-Twin Cities mileage is somewhat over 400, 437 via Burlington, to be exact.

But have you every thought of the *Zephyr* as a portent of what can be done with all-day high-speed streamlined trains? Have you ever thought of the Chicago-Twin Cities run in relation to the Chicago-New York run?

Last week I rode 874 miles by *Zephyr* between 9 a.m. and 11 p.m. This is only 34 miles short of the Pennsylvania's New York-Chicago mileage. And the *Zephyr* spent slightly more than 15 minutes of the time turning around at Minneapolis, for this 874-mile run is the daily round-trip stint of the two *Twin Zephyr* trains. When I rode more than the 437-mile one-way trip I wasn't getting anywhere except back where I started from, but the trip did show what can be covered between breakfast time and bedtime. The experience of riding that much mileage during waking hours is a bit breathtaking, but not at all uncomfortable or even tiring in modern equipment.

For nearly 300 miles the *Twin Zephyrs* ride the scenic Mississippi line of the Burlington, nearly perfect railroad nestled between the bluffs and the water. It is nearly 300 miles with a ruling grade of only .3 of one per cent and with no curves, except near station stops, of sharper than two degrees. Almost all of the line has less than one degree curvature and less than .2 of one per cent grade. Although the tracks continually curve this way and that to follow the narrow natural right of way defined by the bluffs and the shore, the few speed restrictions on the *Zephyr's* normal 95 miles per hour are caused by junctions, drawbridges, and such obstructions, almost never by curves. For most of the Mississippi River run the engineer simply keeps the throttle wide open from stop to stop, and the train gracefully glides from one curve into the next, giving a constantly shifting view of now the broad river bottoms, again the wide expanse of water, or sometimes the steep, tree-coveredbluffs of the opposite shore drawn suddenly close.

The *Morning Zephyr* threads its way over the slip switches and out of the south throat of Chicago Union Station at 9 o'clock, just in the midst of the morning rush of inbound through and suburban trains. The Pennsy's *General* and *Liberty Limited*, the *Empire Builder* and the *North Coast*, and one or two of the Q's many locals are likely to be seen either just arrived in the station or along the crowded multiple-track lead between the station and Sixteenth St. where the Burlington swings west. To the east of the lead is the Pennsylvania coach yard, to the west the Burlington coach yard.

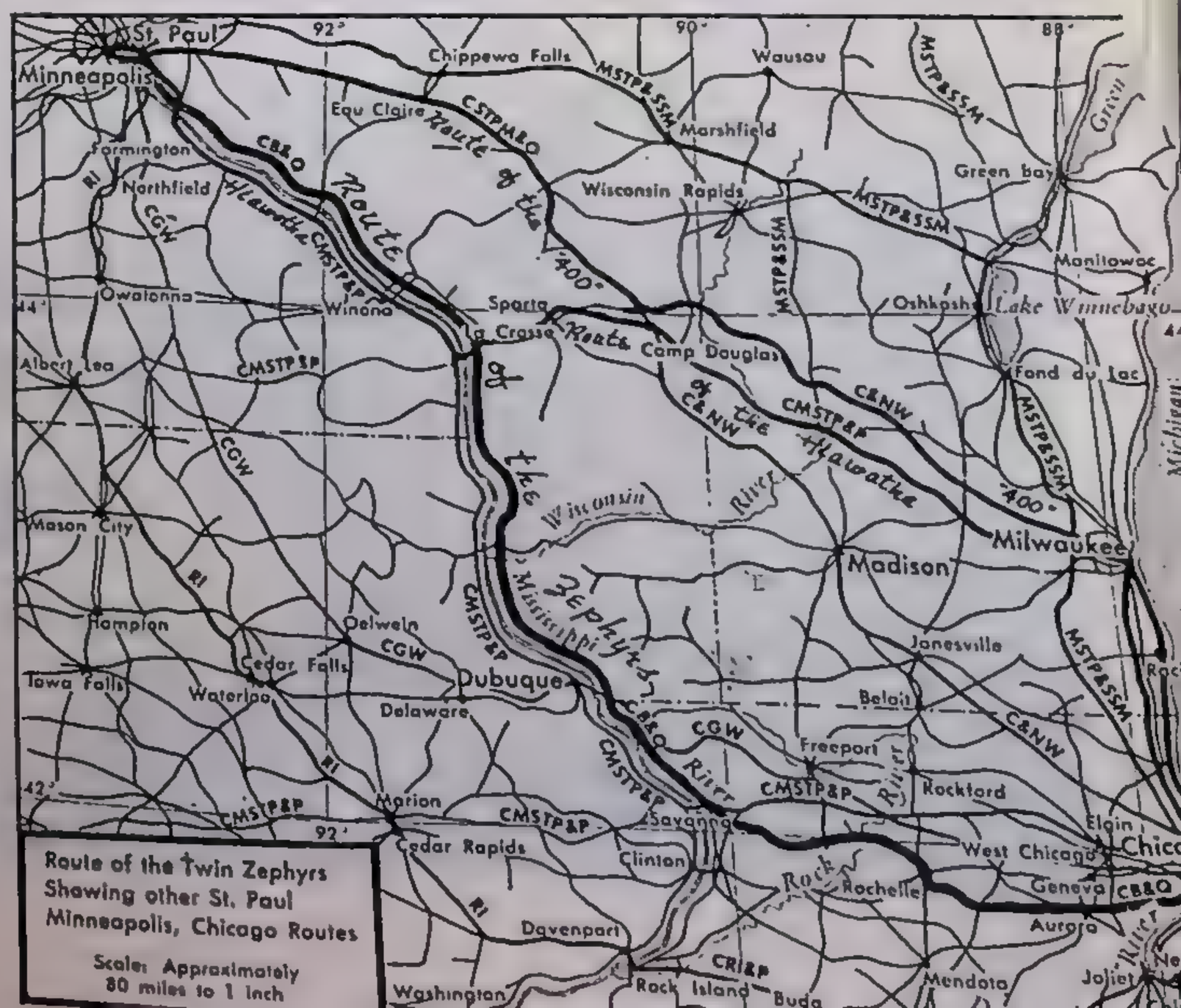
From here to Aurora the Burlington line is one of those magnificent railroad approaches to Chicago which were built while the city was very young and straight line railroads were

All photos courtesy Burlington Rou'

Twin Zephyr service between the Twin Cities and Chicago was innaugurated April 21, 1935, with two three-car trains each making a one-way trip daily. Record of 5 hours, 33 minutes for Chicago-St. Paul had been set April 6, 1935.

still possible. With only the most gradual curves it strikes out across the flat lands through the string of fine suburban communities which Q service has made possible. Except for some four-track in the city, the line is three tracks with the center one signaled for either direction and with crossovers at convenient intervals.

Usually the *Morning Zephyr* is on track 1, the outside westbound, as far as Downers Grove, 21 miles



out, while the center track is reserved for eastbound through trains, including extra sections of the *Empire Builder* and *North Coast* and the *Denver Zephyr.* But at Downers, terminal for many suburban runs, the signals indicate a crossover to the center track and our *Zephyr* slows to 50, swings across, and quickly picks up to 95 for the spurt to Aurora. On this stretch we pass a light Pacific batting off a good 65 to 70 with a westbound suburban train. Coming into Aurora, the railwise traveler keeps an eye open for Eola yards on the south side of the tracks four miles east of the station, and almost at the station to the north side of the tracks the large Burlington storehouses and shops, sprawled over a large area.

To the Burlington, Aurora is a city of much importance. Not only is it the birthplace of the road, which started here as the Aurora Branch Railroad in 1850, but it is the end of suburban service and an important junction and transfer point. Practically all through trains stop here to accomodate passengers living in the suburban zone. Just beyond the station Twin Cities trains leave the Burlington's main line west and enter the single-track Savanna line which shortcuts across northern Illinois to the Mississippi River. Centralized traffic control begins at Aurora and will soon extend all the way to Savanna, making C.T.C. or double track all the way from Chicago to the Twin Cities.

Once on the Aurora-Savanna subdivision a sharp change in the character of the line becomes apparent. The road cuts across the drainage, with the worst grades caused by the valleys and divides of the Fox and Rock Rivers. Curvature, with few exceptions, has been reduced to two degrees maximum, but grades run to .8 of one per cent, quite a contrast with the almost level line east of Aurora, and with the water level Mississippi line soon to come. The wooded valleys and the rock cuts through the crests are good scenery, however. At Rochelle the main line west of the North Western is crossed. A bit farther west the sharp-eyed rider will keep an eye open for the 48-foot Black Hawk statue which stands overlooking the Rock River valley two miles north of the Burlington tracks.

Over this single-track portion of the run the *Morning Zephyr* moves right along, its meets eased by C.T.C. The average speed is 69.1 miles per hour, a neat performance on road of this character but nothing compared with what is coming along the Mississippi.

Savanna is an important junction point on the Q's low-grade freight line from the southern Illinois coal fields to St. Paul, and it is likewise the important freight classification point on the Milwaukee's lines between Kansas City and Milwaukee and between Chicago and Omaha. The large Milwaukee yards, which handle more than 3000 cars a day, can be seen along the

The three-car trains were replaced December 18, 1936, by two seven-car units, which in turn were lengthened to eight cars (below) in 1937. At many places along the Mississippi, old railroad right of way, replaced about 1911, is used by highway while present easy Burlington curves shortcut closer to river.

The original three-car Twin Zephyrs were christened by twins and then were exhibited at cities along the line. Here they are at St. Paul, with Great Northern's historic William Crooks and Northern Pacific's Minnetonka and some modern locomotives. Twin No. 9902 is now in Rock Island's service as the Texas Rocket between Dallas-Fort Worth and Oklahoma City; Twin No. 9901 was badly damaged by fire last year while serving as the Sam Houston Zephyr between Houston and Dallas.

north side of the Burlington before reaching the station.

Now the rails begin to slide beneath in earnest. We are on the broad level bottom land which the river has formed through the years at Savanna and soon the river itself is flowing beneath the left windows of the train. Junctions and joint operation over Illinois Central track for a few miles south of East Dubuque slow the average for the first 40 miles down to not much more than the once magic mile-a-minute, but beyond East Dubuque it is no trick at all to knock off the world's record 55 miles to Prairie Du Chien in exactly 39 minutes on the button.

This is a country rich in history, the land of the early French explorers and of the Black Hawk Indian wars. Many hundreds of miles along the river are original wilderness as they were then, thanks to a wise conservation measure. The towns and cities along our route are equally rich in romance. Every settlement we pass is redolent of the early West, when it was a tribal center, a military fort, a fur trading post or steamboat levee.

The railroad is also rich in history. It was one of the strongest arms of James J. Hill's system, and the Empire Builder himself took a part in making it into a natural high-speed route decades ahead of the need.

The late Elmer Howson, western editor of Railway Age, told the story of the decision. Howson had in 1909 just been appointed division engineer of the Burlington's LaCrosse Division, Savanna to St. Paul. His boss asked him to prepare an estimate of the cost of double-tracking and another estimate of the additional cost of at the same time reducing the already good grades to .2 of one per cent and the already good curves to one degree. Howson whistled in surprise, but went to work on the estimates. He rode up and down the division, gradually figuring the cost of new embankment and riprap here to pull a curve toward the

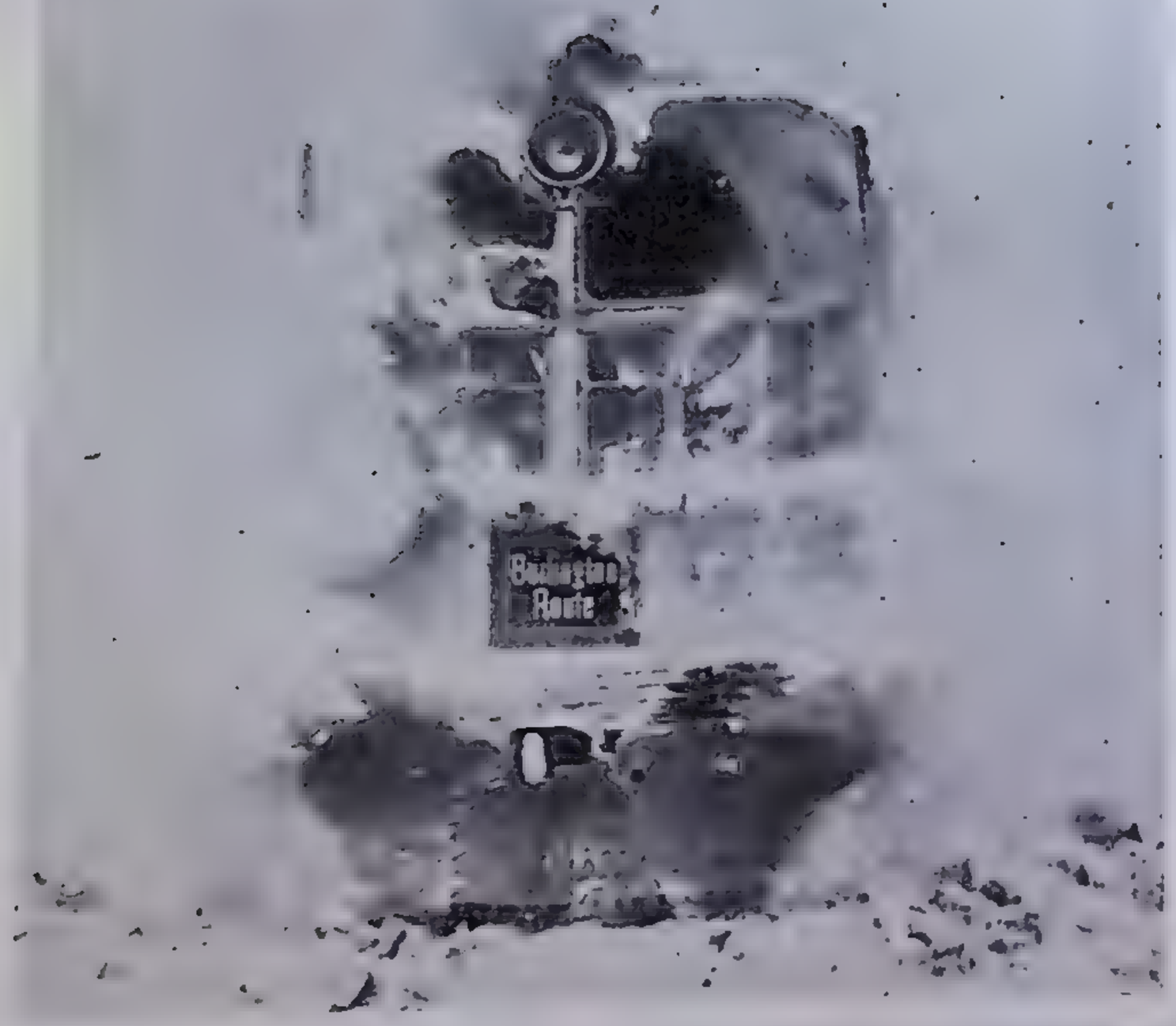
river, and additional excavation there to pull another curve in toward the bluffs.

Finally his figures were ready. The boss said, "Hill will be in his business car on 52 out of St. Paul on Wednesday morning. Meet me on the car."

For 15 minutes or more James J. Hill looked over correspondence and signed his name. He came to a stopping point and said, "Gentlemen, you wished to see me."

Howson said he had the estimates, and named the figures, one for plain double-tracking, and the other, much higher, for improved grades and curves. Hill folded his hands and said nothing for five minutes.

Then, "You will please proceed with the full improve-



Dramatic photo of Zephyr bucking snow was made with telephoto lens. In order to get shot, snow had to be reshoveled onto tracks, as they had already been cleared. Section foreman said, "Bosses sure crazy!" Zephyr below is on way into Chicago Union Station. Cars are locomotive, auxiliary power car and cocktail lounge, two coaches, dinette-coach, diner, coach, parlor-observation.

Westbound Twin Zephyr at Aurora station. Here Twin Cities trains leave the Burlington's main line to Omaha and Denver and enter the C.T.C. dispatched single-track road toward Savanna.

ment program. Someday competition will be much stiffer and we will be ready for it."

And so when Hill wanted to put southern Illinois coal in the Minnesota market and needed a freight rate of less than $2.10 a ton to do it, the road was ready. And so it also was ready a quarter century later when the Burlington wished to match the schedule of the somewhat shorter Milwaukee and North Western streamliner routes between Chicago and the Twin Cities. Some spiraling of curves and C.T.C. at the few single-track throats over drawbridges is about all that has been needed.

North of Prescott, where the railroad crosses the beautiful St. Croix River just at its junction with the Mississippi, the Milwaukee and Burlington use their single-track lines jointly as a double track into St. Paul. Both roads run lefthanded, the Burlington track next to the river being used as the westbound main and the Milwaukee track higher on the bluff as the eastbound. At St. Paul the *Zephyr* wyes, leaving the station from the east end to run to Minneapolis over the historic Great Northern line which includes the oldest bridge across the Mississippi.

The turnaround at Minneapolis is a marvel of fast work. While people are still leaving the coaches at one end car cleaners are at work in the other end. As soon as the last passenger is off, the train is quickly wyed just west of the station and backed into a servicing track which includes fuel and water facilities and a drop pit for changing trucks or wheels. While the car cleaners finish off their work with a thorough mopping of the vestibule floors and a vacuuming of the carpeting, the locomotive is fueled and the cooling water tanks are filled. Other service men fill drinking water tanks.

The last of the service men step into the clear and without a second lost the train moves over the thousand yards into the Great Northern station for an interurban-like stop, and at a little the shady side of four o'clock the *Afternoon Zephyr* is off past the Falls of St. Anthony and the flour mills for the return half of its 874 daily miles.

What has this run meant to passenger traffic? Before the *Zephyrs* were introduced 80 per cent of Chicago-Twin Cities passengers rode the overnight trains. The *Zephyrs* reversed the percentage!

Dixon Hill Improvement

Engineers with modern machines hew new roadbed through Gasconade cliffs to flatten Frisco's bad grade

A PHOTO STORY

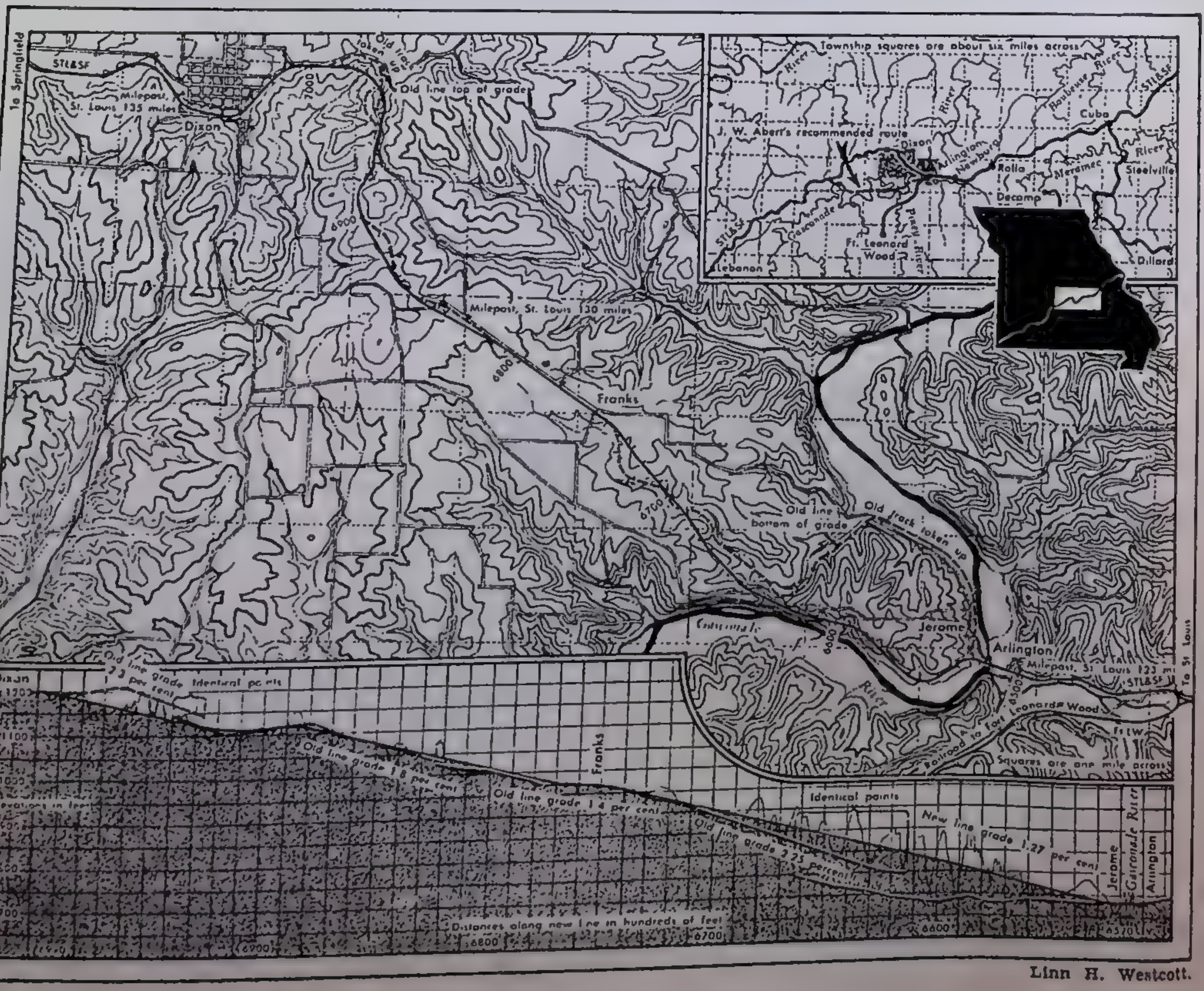
RAILROAD historians may recall the ill-fated Atlantic & Pacific railroad projected from St. Louis to California. Part of the route was actually built back in the '60's, and is now the Frisco main line running southwest across Missouri. When the original surveys were made, engineer James W. Abert laid out an excellent line. For the most part, it passed along the crests of the hills which, in this part of the country, ran in just the right direction for the railroad.

But one plane, about halfway from St. Louis to Springfield, made it necessary to lay the line down into and across the valley of the Gasconade River, some 500 feet below the hill crests. Here again Abert did a fine job of locating the route. He followed the river westward from Arlington for several miles, piercing the gaps between loops of the deep meandering stream with tunnels. But that part of the line existed only on paper. The railroad had a time clause to meet in its charter, with so little time allowed to complete construction that tunnels pierced with slow drills and gunpowder were out of the question.

A short, steep, and very crooked line was built from Arlington, directly up the slope to Dixon as shown by the dashed line on the map. This route had grades of 2.3 per cent, necessitating an expensive pusher engine service, and the curves imposed slow orders on all trains running down the hill.

As a part of its improvement program, the Frisco recently completed a relocation of this part of the line, cutting the grades down to 1.27 per cent and removing curves totalling three circles.

Instead of using James Abert's old survey with the tunnels, requiring many miles of new track, the engineers found a route much closer to the existing line, and, in fact, used considerable distances of the old right of way for the new grading. This new route would



Linn H. Westcott.

not have been practical back in the '60's because of the ruggedness of the cliffs along the Gasconade (see photos on this page) and the depths of the cuttings (see photos on page 18). But modern machinery, power shovels, bulldozers, trucks and blasting have made it much easier to turn rock into a railroad grade.

In one of the pictures a temporary trestle carries the old main line over the new cutting just a short distance below the summit. A helper is crossing the trestle while the smoke of the other engine can be seen over the trees to the right. A few days after this picture was made the track in the cutting was aligned and ballasted and the old line was torn up. The picture on the front cover of this issue was also made in this cutting just before the rails were aligned.

On this page are several views of the cliff cutting along the Gasconade. The finished grade is about 150 feet above the river.

Along the river.

All illustrations courtesy Fris

Temporary overpass near Dixon.

Looking northwest from a point near the river.

Only in the last few years have scenes of railroad construction looked like this. Previously many men with picks and shovels were required to move the loose material and the roadways were cut much narrower for first cost economy.

On this page the lower left picture looks northwest from the point where the new line swings away from the river. The grade is not apparent but the immensity of the earth work can be judged by the machinery in the distant cut. The old line is hidden by the trees in a ravine to the right.

The workmen (photo at right) are putting finishing touches to the track before alignment. The machine in the foreground is an automatic bolt-tightener, a sort of power wrench.

Engine 4522 may smoke and steam a lot but it needs no helper to pull an early morning freight over the new track. This was one of the first trains to use the new Dixon Hill.

Bolt-tightening machine.

One engine where formerly two were needed.

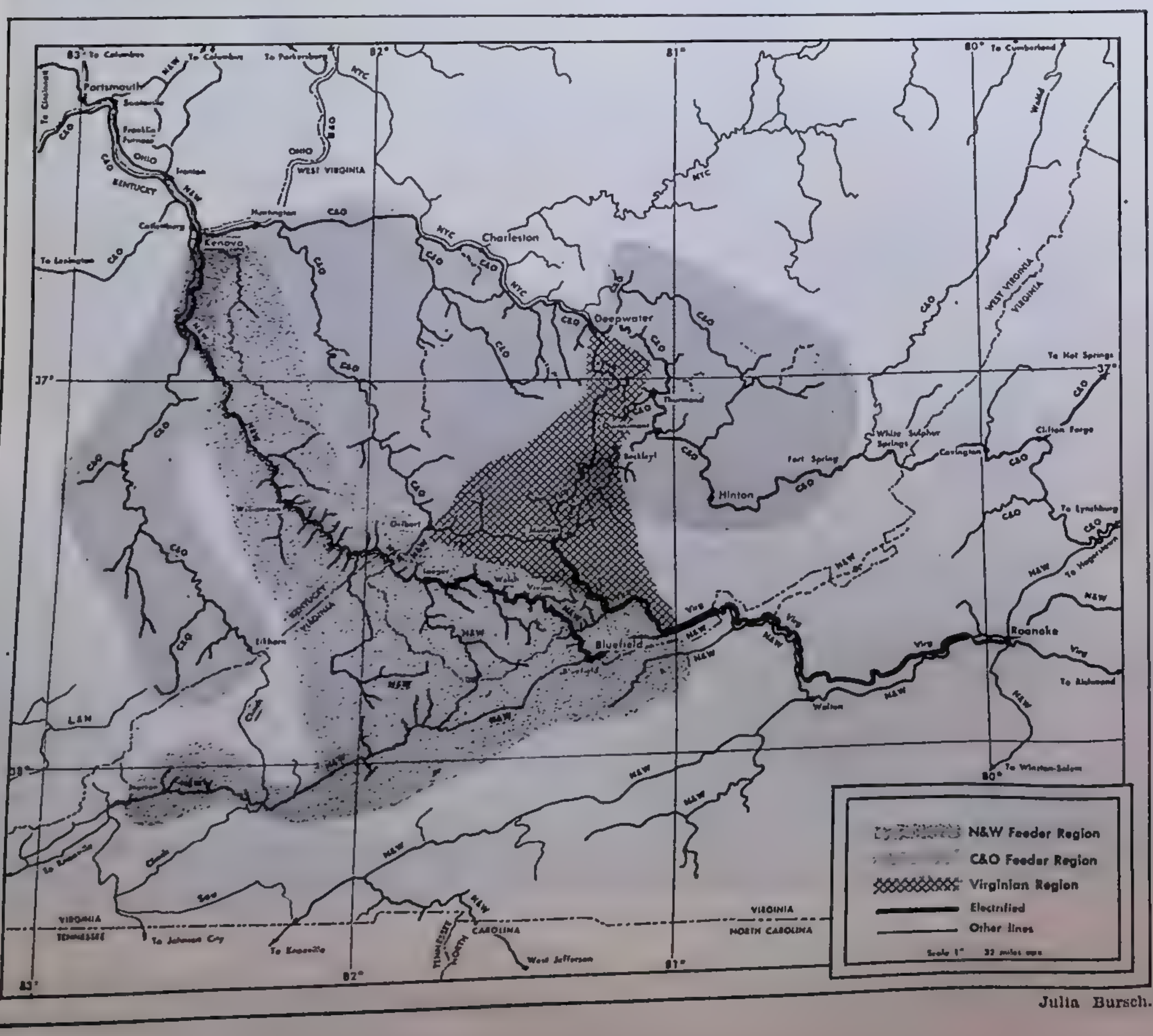
George W. Purdy, U. S. Army.

A Norfolk & Western freight blasts westbound up the grade out of the New River Valley to the summit at Bluefield, W. Va. The eastbound grade on the other side of Bluefield is electrified.

H. P. Stearns, Railroad Photographic Club, 47 Royal St., Allston St., Boston 34, Mass.

No. 3, the Virginian's only passenger train westward (shown above near Herndon on the electrified division), makes an all-day run between Norfolk and Charleston.

The map below illustrates that although the C&O, Virginian, and N&W systems intertwine, their coal feeder regions are distinct. Recently a new area has been opened up and made accessible to all three roads at Gilbert. Electrified sections of the N&W and the Virginian are shown in heavy lines, while medium lines indicate other N&W, Viriginian and C&O service. This entire area is cut with deep ravines which intersect the various coal strata.



Julia Bursch.

Big Three

C&O, N&W and Virginian make West Virginia soft coal a potent factor in the nation's industry

BY STUART COVINGTON

CHIEF factor in the success of the Chesapeake & Ohio, Norfolk & Western and Virginian railroads is West Virginia soft coal. If coal were not shipped over their rails, the roads would be in sad extremities, since bituminous constitutes 77 per cent of their collective revenues. And the prime reason West Virginia bituminous coal dominates the market is this triumverate of rail carriers, for without their low rates the coal could not compete successfully in other parts of the nation. The three rail lines, known usually as the "Pocohontas roads," haul most of West Virginia's coal to market, accounting for at least four fifths of the state's rail mileage. All transport coal in bulk to the same markets, over the same terrain, with nearly the same motive power. They face identical problems, yet each meets them differently. Each offers the same service, but of a varied sort. They compete, yet are friendly neighbors,

The Chesapeake & Ohio's new 2-6-6-6 Allegheny type locomotive is an example of a machine designed especially for a certain job, moving tonnage trains of coal with highest efficiency. It is the heaviest four-cylinder six-coupled articulated locomotive built to date. Lima has built 45 of these C&O giants.

Chesapeake & Ohio.

forming what might be called a "Big Three."

The C&O and N&W each haul a tenth of the nation's soft coal, which, when the producing areas of Pennsylvania, Alabama, Illinois, Indiana, Texas, Oklahoma and the Far West are considered, is a whale of a lot of bituminous ton units. Transport of coal on the N&W has jumped 45 per cent due to wartime increase in consumption, and nearly as much on the other two roads. N&W delivered 10,161 cars of coal to the C&O at Valley Crossing, O., typical interchange point, during November of 1943.

The major reason the three carriers live in harmony is that each serves a separate district, though any might invade the others' territory. The Pocahontas and New River areas are the largest coal fields served by the Big Three, producing 13 million tons per year, nearly a third of all the coal mined in the United States. The state's supply, it is estimated, will last 500 years.

Bituminous coal, as mined in the Pocahontas and New River areas, costs slightly more than $2 per ton to produce. Blasting powder dislodges the mineral in small workings and the coal is then pushed in cars to rotary car dumpers which turn the units on end and dump the cargo into hopper cars.

Mechanical mining is used extensively in larger mines, very little work being done by hand. Power drills dislodge the coal, which is taken out of the seams (coal deposits) by undercutting machines which also overcut (cut at the top of the seam), middle-cut (cut into its center) and shear (cut vertically into both ribs). The coal is gobbled by mechanical loaders which shoot it into mine cars pulled by electric "mules" or by the more recently developed battery-operated trucks called "buggies."

In other mines the coal is conveyed to the cars by tractor-trailer outfits, the trailers having drop bottoms. The coal is released through these bottoms to a belt conveyor for delivery to the tipple or mine shaft, depending upon the type of mine.

Coke is also produced extensively in the Big Three's coal regions. This product is used in blast furnaces, coke ovens and various allied industries, and 1,686,070 tons were produced in 1939. The Big Three hauled most of the tonnage to market. While coke cannot always be substituted for coal, in the regions to which the Big Three hauls it, it is much better adapted for use as a fuel—so much so that in 1939 $212,000,884 worth was sold.

Largest coal hauler of the Big Three is the C&O, which hauled 61 million tons in 1943. Its

Top, Chesapeake & Ohio; bottom, Richard Dill, 115 River St., Piqua, O.

Much C&O coal goes into lake ships at Toledo, where the road has three car dumpers at Presque Isle. Each slip permits mooring 10 large vessels at one time. The Mallet articulated compound in the lower picture is pulling 160 empties on the N&W near Columbus, O.

chief coal line extends from Huntington to Clifton Forge, W. Va., with numerous branches bisecting the main line, which pierces the New River, Kanawha and Kentucky coal regions. C&O's main line stretches through Kentucky, Virginia, and West Virginia to the nation's capital and to Cincinnati and Chicago. A secondary main line stretches from Richmond to Gordonsville, Va., and also serves Phoebus and Newport News. Lines diverge at Ashland to Columbus, Toledo and Louisville, gained via L&N tracks from Lexington. Less important lines connect Ronceverte and Barstow, W. Va., Columbus and Pomeroy, O., Logan and Athens, O., and Clifton Forge and Richmond, Va., providing alternate routes between the latter points. Heaviest freight traffic is between Ashland, Charleston and Newport News. Most of C&O's passenger business flows between Washington and Cincinnati. This territory boasts great historical importance, since Jamestown, Old Point Comfort and Williamsburg, site of the first university in America, are near C&O tracks, and Richmond, a C&O terminal, was once capital of the Confederacy.

Bulging C&O hoppers trundle through Richmond on their way to Hampton Roads and ship loading, while others roll to Chicago and Cleveland, west to Louisville or north to Detroit. C&O also hauls coal from its own extensive mines in the Kanawha Valley. Their tonnage forms an important part of the road's coal traffic. Nearly as important are the heavy shipments of paper from the plant of the West Virginia Pulp & Paper Company (Westvaco Products) at Covington, W. Va. C&O daily moves 80 to 100 cars to and from the mill's four miles of sidings. Carloads of the paper are hauled to the presses of *Life, Look, Cosmopolitan* and *Good Housekeeping*. C&O Greenbriars (4-8-4) jog into Lynchburg's smoky yards with 90-odd "high sides" of this and other "preference freight," bound for Washington and Richmond, then slide out to tackle the hills beyond.

The larger sisters of the Greenbriars, C&O's new Allegheny (2-6-6-6) engines, named for the mountain range they conquer, rank as some of the heaviest motive power in all the East. Two score of the giants are now in C&O service—the only U. S. engines boasting six-wheel trailing trucks. The Alleghenies, which cost C&O a quarter of a million dollars apiece, are now in coal train service, having replaced the road's Texas engines, which previously replaced the 2-8-8-2 Mallets. The Texas engines now handle hot merchandise runs and an occasional passenger train. Most passenger trains are hauled by super-Pacific types, converted

Here's where it all starts. Thousands of cars are loaded with West Virginia bituminous coal at hundreds of mines, and the railroad is by far the most efficient method yet devised to get the coal to market. Low railroad rates enable West Virginia coal to compete with fuels in districts a thousand miles and more away.

Norfolk & Western.

Top, George W. Purdy, U. S. Army; bottom, Robert McKell, Chillicothe, O.

Both Virginian and N&W use electric power on portions of their lines. The three-unit Virginian motor above is on a westbound freight at Glen Lyn, Va. Both C&O and N&W operate fine through passenger service over their main lines. The Fast Flying Virginian, popularly known as the FFV, is stopped at South Portsmouth, Ky. The daylight trip along the Ohio River on the FFV is a travel treat.

from conventional engines of the same design. The Pacifics were equipped with larger drivers, more powerful feedwater heaters, added grate areas and Vanderbuilt tenders, and they were given a handsome livery of blue which successfully distinguishes them from other power. Their headlights were placed directly beneath the boiler, as on some freight engines.

The Pacifics and their sister engines are cared for at the C&O's large shops at Huntington, W. Va. Boss of the shops is C. B. Hitch, chief mechanical officer, with headquarters at Richmond. His forces groom the speedsters which power C&O's premier train, the *George Washington.*

The *"George"* was the first completely air-conditioned train in the land, and it maintains a place all its own in raildom due to C&O's famous "sleeping Cheshire." "Chessie" heralded the arrival of the *George Washington* back in the early '30's, when passenger business had sunk cellarward. Business returned with a rush when the new train hit the rails, however. The *"George"* succeeded so well that it and its sister speedsters, the *FFV* and the *Sportsman,* now operate in two regularly designated sections.

Though the train's equipment is of conventional construction, the interior is quite the opposite. Pullmans and lounges (a mid-train lounge is an innovation) are of colonial pattern of the Revolutionary period, and the observation car is adorned by a bust of Washington. Dining cars are done in the Mount Vernon motif.

Its through Pullmans roll in Big Four trains from Cincinnati to Chicago and St. Louis, since only local service is maintained on C&O's Chicago line [January 1944 TRAINS]. *Sportsman* sleepers run in Pere Marquette trains from Toledo to Detroit, and the Pennsy handles through cars from the *FFV* and the *George Washington* to Washington and New York.

The cornerstone for the present C&O was laid in 1785, when George Washington surveyed a canal between the James and the Ohio rivers and recommended that the waterway be built. But the canal project was abandoned and a railroad laid over its route instead. The actual father of the C&O, however, was Collis P. Huntington, who became its first president in 1869. Huntington took over the management of the unfinished James River & Kanawha Company that year and laid its rails to the Ohio River, diverting water shipments of coal to his railroad. He then pushed the C&O into Washington, Newport News and finally Cincinnati. The road immediately began hauling coal, five mines using its rails the first year. Ten mines shipped the second year, and 19 the third. Sixty-one million tons of coal were hauled out in 1943, we are told by C&O's magazine, *Tracks.* George Washington's railroad is now the second largest soft-coal carrier in the land.

C&O's present boss is able, fortyish Carl El-

Norfolk & Western.

Norfolk & Western uses some third track so arranged that the center track can be used as siding or passing track for either direction. This scene is at Salem, Va.

Stephen A. Lieber, 250 Primrose Ave., Mt. Vernon N.

A Norfolk & Western freight train about 150 yards east of the Baltimore & Ohio crossing in the eastern part of Cincinnati. The merchandise train in background is B&O, waiting for the crossing.

bridge Newton, Dartmouth alumnus, post-graduate Harvard law student, Rhodes scholar and all-around railroader. Newton went to the C&O's board of directors from the presidency of a law firm in 1942. He became president of the road in December, succeeding G. D. Brooke.

Like Carl Newton, shrewd, middle-aged W. J. Jenks, captain of the bustling Norfolk & Western, is a top-hand railroader. He bosses 23,000 workers and one of the busiest railroads in the land, the Southeast's most prosperous. Since 1939, 75 million dollars have been expended for improvements which include expansion of terminal facilities, rebuilding, construction and modernization of rolling stock, installation of C. T. C., improvements to track and roadbed, and construction and extension of sidings.

The N&W extends from Norfolk to Cincinnati, with secondary lines sprawling to Hagerstown, Md., Bristol, Va., and Durham and Winston-Salem, N. C. Trackage rights over the At-

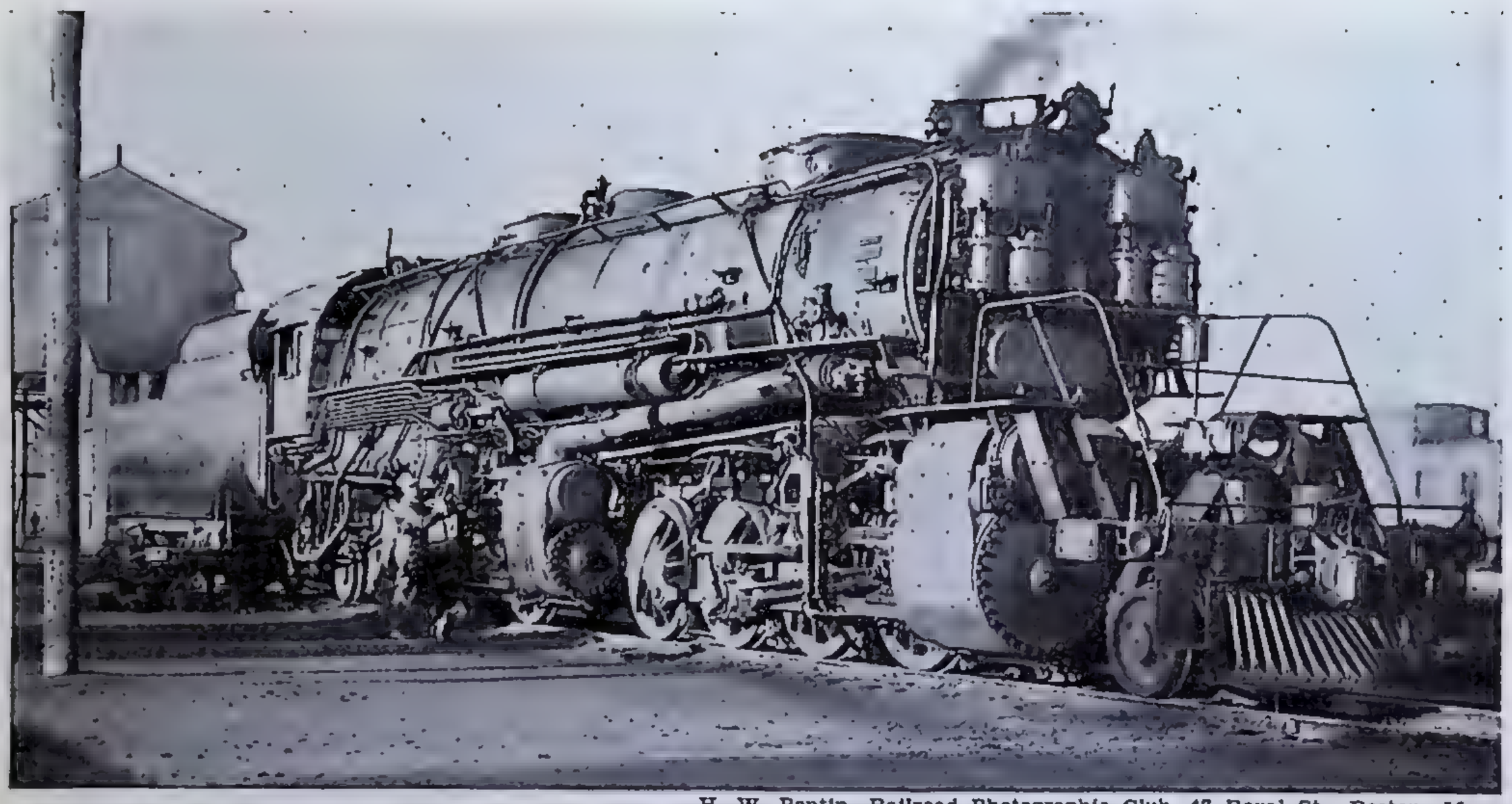
lantic Coast Line from Richmond to Petersburg provide a through route between Richmond and Norfolk. Heaviest freight business is from Kenova and Bluefield to Norfolk, with nearly as much south to Bristol. Heaviest passenger traffic is between Lynchburg and Walton, four N&W and three Southern flyers using the route. Passenger traffic has leaped to 874 per cent of its former level, coal traffic to 150 per cent and other traffic to more than 179 per cent. Passenger-miles for 1942 were 475,242,227. 750,000 tons of coal have been diverted to the Shenandoah Valley line from other routes.

N&W's richest source of coal traffic is the 200 rugged mountain miles between Bluefield and Kenova, W. Va., which tap the Thacker, Pocahontas, Kenova, Upper Buchanan, Tug River and Clinch Valley districts. Slogging trains of dusty hoppers trundling behind N&W's Y-6 Mallets are passed with a roar and a shriek by the gleaming *Pocahontas,* N&W's crack Norfolk-Cincinnati train, her rapidly exhausting Class J battering down the mountain miles with half a score of jouncing sleepers.

When one of these coal drags grinds to a halt at Iaeger, W. Va., the grimy Mallet chuffs to the roundhouse and a quiet but hard-pulling electric takes its place. The juice engine's grumbling motors will hoist the drag over 52 miles of rugged grades which end at Bluefield, W. Va. East of Bluefield a Class A 2-6-6-4 dual-service articulated engine may take charge. The Class A's can maintain a maximum sustained drawbar horsepower of 6300 at 45 miles per hour. Alternate choice for motive power is a compound Y-6 2-8-8-2, the type N&W uses to wheel its fast merchandise runs. The Y-6's dominate N&W's fleet of 600 modern, well-

Coal is king on the N&W and yard scenes leave little doubt as to the predominant traffic. The view below at Williamson Yards, Williamson, W. Va., is typical.

Norfolk & Western.



H. W. Pontin, Railroad Photographic Club, 47 Royal St., Boston, Mass.

The true Mallet articulated compound locomotive, which on most American railroads has been long ago supplanted by the simple articulated, still flourishes on the Big Three where it accomplishes more efficient use of steam at slow speed. This Virginian engine is being groomed at Victoria, Ga.

groomed locomotives. Standard-bearers of the 600 are the sightly, chromium-bedecked Class J's, newest and most modern of the 75-unit passenger fleet. The 4-8-4's, which were completely assembled in N&W's vast Roanoke shops, wheel most of the road's crack passenger runs.

Chief passenger train is the aforementioned *Pocahontas.* The *"Poke"* carries through sleepers from Norfolk to Columbus and Cincinnati and from Lynchburg to Cincinnati. The *Cavalier,* its companion train, carries Pullmans from Richmond and Roanoke to Norfolk and Cincinnati.

N&W also handles three Southern flyers from Lynchburg to Bristol, where Southern again takes over. These are the *Tennesseean,* streamliner between Washington and Memphis, the *Birmingham Special* between Washington and Birmingham, and the *Washington - New Orleans Express* between Washington and the Crescent City.

In turn, Southern assists N&W by taking its Cincinnati - Washington freight from Lynchburg to the capital city. N&W freight is also taken in tow by Pennsy engines and trundled across hilly Maryland terrain to Philadelphia and New York. The Pennsy also takes N&W's Chicago freight at Cincinnati. Cleveland-bound freight rolls north from Columbus in Big Four trains.

An important part of this freight is leaf tobacco, which N&W hustles to eastern markets from the growing-regions surrounding Durham and Winston-Salem and, via connections, from Raleigh, Wadesboro, Greensboro and Charlotte. Another important revenue is the volume of manufactured items from regions surrounding Columbus, Cincinnati and Chicago.

The N&W's first train puffed out of the surprised settlement of Petersburg, Va., to City Point (now Hopewell) in 1838. The road extended rapidly, and in 1856 the Virginia & Tennessee, a 204-mile line between Lynchburg and Bristol, was acquired. The Southside Railroad, a line from Petersburg to Lynchburg, 123 miles, was acquired in 1854, and later the Petersburg Railroad, extending 81 miles between Petersburg and Norfolk, was added. Steel rails joined Norfolk and Bristol in 1870 and the line became the Atlantic, Mississippi & Ohio. The AM&O toppled into a receivership, precipitated by a panic, three years later, and emerged in 1881 as the Norfolk & Western. The first N&W hopperload of Pocahontas coal rolled down to tidewater in 1883, and in 1890 the road acquired the Shenandoah Valley line, then in receivers' hands. Receivership again befell the parent line a short while later when a second depression plunged it into bankruptcy. Reorganization ended the receivership in 1896 and that year

the Lynchburg & Durham and the Roanoke & Southern were added to the mileage. The Cincinnati, Portsmouth & Virginia, known as the "Coat, Pants and Vest," was acquired in 1901, extending the road from Scotiaville to the Queen City.

SMALLEST and newest of the Big Three is the 653-mile Virginian, its L-shaped route extending from Sewalls Point to Deepwater Bridge, W. Va. The Winding Gulf, Stone Coal, White Oak and Virginia & Western branches are the Virginian's only important secondary lines. Its chief coal region is the Pocahontas, which it shares with the N&W, but since Virginian's route is shorter, it gains most of this traffic. Most of the coal travels to Sewalls Point for ship loading, while a very few cars are delivered to the NYC at Deepwater Junction, W. Va., for forwarding to the Midwest.

Father of the Virginian was Henry Huddleston Rogers, captain of industry, financier and mine owner, who began its construction in 1904. His road immediately became successful, and in 1943 earned 27 millions, paying $1.50 annual dividends on its preferred stock and a neat $2.50 on its common shares. The ample returns were due to the fact that Virginian hauled 13,574,455 tons of coal in 1943. This tonnage moved from 63 mines bordering its rails, 27 of which were served jointly with the C&O and N&W. The miners employed in their shafts, using the Virginian's lone passenger run for their occasional trips, have increased the road's passenger revenue a hearty 47.62 per cent.

The Virginian's prosperity is due mainly to its astonishingly low operating ratio, made possible by operation of long, heavy trains pushed by braces of huffing Mallets. Its 137 miles of electrified lines, over which growl its enormous three-unit motors, boast an even lower ratio.

Virginian's 700-series 2-8-8-2 Mallets, equipped with forward cylinders as large as small houses, are nearly as powerful as the electric motors. The Mallets and Virginian's other husky freight haulers are groomed at Princeton, W. Va., in the road's principal shops, bossed by G. T. Strong, superintendent of motive power.

The 700's and their sister engines deliver little freight to connecting roads, much of the Virginian's freight traffic originating and terminating on the line. The New York Central is the main traffic connection. A connection with the neighboring N&W at Roanoke and Gilbert, giving Virginian access to southern points, is of less importance.

The westbound mainline passenger train of the Virginian (right) meets a branch line train (since discontinued) at Mullens, W. Va. The Virginian's one train each way daily gives service to all stations on the entire main line from Charleston to Norfolk. It takes two days to cover this entire run, however.

H. W. Pontin, Railroad Photographic Club.

Piedmont & Northern, No. 5611

Built in 1941, this engine is one of the newest operating on the Piedmont & Northern system in the Carolinas. The locomotive was assembled by welding processes in the General Electric plant at East Erie, Pa., classification: B-B+B-B 236/236-8GE212. It has sufficient power to handle 1800-ton loads on the P&N line which is operated with 1500 volts D.C. The locomotive is of the eight-axle four-truck type with total weight, all on drivers, of 236,000 pounds; there are no idle axles. One of the requirements of design was that the engine had to be able to negotiate 150 ft. radius curves.

The Piedmont & Northern is an electrified freight and passenger railroad operating in two divisions not physically connected. The larger is from Greenwood, S. C., via Greenville to Spartanburg, 89.4 miles. The other division is 23.4 miles between Charlotte, N. C. and Gastonia. A proposed line to connect these divisions and also to reach the affiliated Durham & Southern is projected but has not been approved by the I.C.C.

Wouldn't it be nice if:

. . . the Western Pacific and Great Northern ran the new streamlined *Empire Builder* into Oakland and San Francisco by way of the Feather River Canyon?

Sgt. Prescott E. Brown.

. . . big railroad stations set aside one window to sell tickets only for trains which were departing within the next 10 or 15 minutes? The way it is now, the man who wants to depart on the next train is often stalled in line behind a man buying Pullman reservations to go all the way across the country week after next.

Ed Pachasa.

. . . a Pullman were to be run from Grand Central to Binghamton and Elmira via Utica after the war?

E. Seelye.

. . . the railroads invested in distinguishable train-announcing systems to replace the vibrating tin horns that are now in altogether too many stations in the country?

Robert M. Vogel.

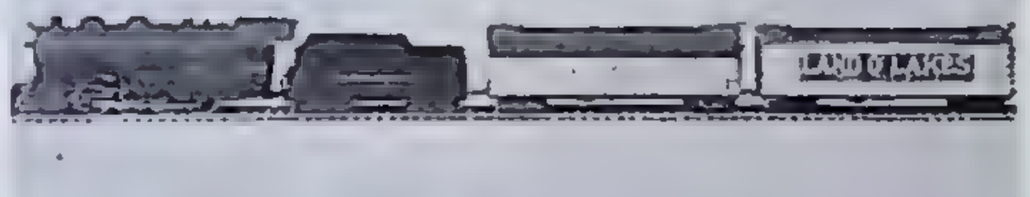
. . . a system could be devised that would eliminate waking coach passengers in the wee hours for the new conductor to check tickets?

Thomas P. Conlon.

. . . all railroads put club cars, or combination club and dining cars, with observation ends on the rear of all trains?

Robert S. Smead.

OWN YOUR OWN RAILROAD



Building scale models of cars, locomotives and even the right of way, itself, is a hobby leading to endless enjoyment.

Write for our booklet on miniature railroading along with our pre-war catalogue—It's interesting reading—Price 25c.

MANTUA METAL PRODUCTS CO.
Woodbury Heights - New Jersey

LIMAS AROUND THE WORLD

Lumbering has long been one of the principal industries of the Philippines. Here a Lima-built Shay locomotive, belonging to the Insular Lumber Company, hauls a log train from forest to sawmill, through a Nipa shack camp on Negros Island.

LIMA LOCOMOTIVE WORKS, INCORPORATED

LIMA OHIO

Don't Sell the Railroads Short

The big improvements in rail transportation are behind the scenes, often unseen by public

BY ERNEST E. NORRIS
President, Southern Railway System

FEW industries in this country have been, and are, more progressive, more alert to invention, more consistently interested in scientific research and technological improvement than the railroads. My statement is strong—but nevertheless it is true. The contact of the public with technological progress in the railroad field unfortunately is limited.

The railroads do not produce a tangible product which can be seen, tested, purchased and used by individuals. On the contrary, the railroads sell only services, and individuals have little opportunity to measure improvements in the machine which renders such services. In fact, technological progress in the railroad field is largely "behind the scenes." It shows up mostly in the cold statistics of safety, of tonnage handled, dependability, economy, efficiency—and sometimes solvency in the face of pyramiding costs and declining revenues.

Exceptions, of course, are such pioneering achievements as the air-conditioning of passenger trains, the streamliners that have so captured public fancy, and our powerful new Diesel locomotives.

As a matter of fact, almost every cog in the railroad's transportation machine has undergone comparable improvement in recent years. Rail is infinitely better and stronger through new processes of manufacture. Cross ties have been improved and their life lengthened by chemical treatment. Track is better maintained by the use of new roadway machines. Steam locomotives have been improved tremendously in efficiency. Diesels are setting up ever higher records of sustained work, longer runs, heavier trains and economical operation. Every detail of our freight and passenger cars—their wheels and trucks, their draft gear, their braking systems, their design—has been immeasurably improved. Signal and communication systems have been revolutionized.

Road, yard and station operations have been modernized and speeded by such improvements as centralized traffic control, elaborate interlocking plants, remote-controlled car retarders, spring switches, teletype, automatic block signals, material-handling machines, cab signals and a host of other applications of modern invention to the art of railroading.

All these things are the result of intensive and continuous research that has been carried on for years by the individual railroads, by the Association of American Railroads and its predecessor organizations, by the railway supply industry, and by some of the country's finest technical schools.

Perhaps of equal importance has been the planned diffusion of "know-how" throughout the railway field. From the gruelling experiences of our war job, the railroads and those who man them have learned many a priceless lesson—how to do more with less; how to get more use out of every tool and facility and car and locomotive; how to make every dollar of expense and every move count.

This great record of a long and productive interest in scientific research, in technological improvement, and in capitalizing on every lesson and experience is gratifying in itself. But even more encouraging is the evidence that the railroad industry realizes that it must never let this interest flag.

For two years a group of more than 150 of the keenest experts in the railroad business has been quietly, but diligently, studying every phase of railroading, every economic and scientific promise of the future, all the competitive forms of transport and their possibilities, and the probable transportation needs of a nation reconverted to the pursuits of peace. This group expects to complete its initial studies next year, after which the work will be continued both by the association and by the individual railroads.

So, when I hear some of my friends proudly talk about the postwar planning of their industries, I make no apologies for the railroads. Instead I just say:

"Preparing for tomorrow's job has always been so much a part of railroading that we forgot to label as 'postwar planning' what we have been doing since Hector was a pup. But that's what it is."

The significance of all this, insofar as my story is concerned, should be obvious: Could it possibly be wise to sell the railroads short when they are as alert and progressive and research-minded as this record proves?

Can you name the railroads?

Below is a list of inter-line name trains. Can you identify the roads over which they operate? Answers on page 39.

1. Copper Country Limited.
2. The Bluebonnet.
3. The Crescent.
4. Empire Builder.
5. City of Miami.
6. City of San Francisco.
7. Washingtonian (Montrealer).
8. Sunshine Special (West Texas).
9. Pine Tree Limited.
10. Southern Belle.
11. Southland.
12. Green Mountain Flyer.
13. Tenneseean.
14. North Coast Limited.
15. Dixie Flagler.
16. Exposition Flyer.
17. Flying Yankee.
18. Sunnyland.
19. Zephyr-Rocket.
20. Mount Royal.

FRISCO'S FAMOUS FLOOR

Its Fine Roadbed

It has been said that "a railroad is as good as its roadbed." Frisco has always been famous for maintaining its roadbed second to none . . . strong, well-graded and smooth-riding.

Consequently in these days of longer, heavier trainloads — Frisco continues to move passengers and freight safely and on schedule.

Frisco's fine roadbed is helping in the elimination of needless delays on the road to Victory.

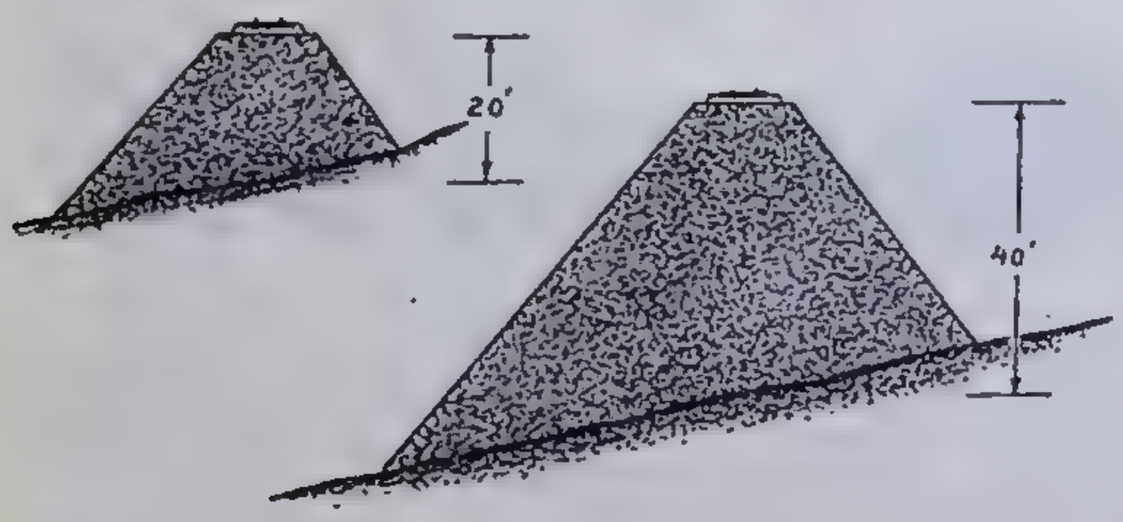
FRISCO LINES

ST. LOUIS-SAN FRANCISCO R.Y.

A Great Railroad

FFF FRISCO FASTER FREIGHT

When Lucious Beebe and a friend, Charles M. Clegg Jr., were out on a picture-taking escapade recently, Clegg set up his camera next to the Lehigh Valley main near Raritan, N. J. All was well except that neither of them noticed a torpedo cap nicely strapped to the rails a few feet away. Along came this heavy freight and bingo! The report startled Clegg and his hand squeezed the trigger, catching the smoke from the torpedo as seen in the above photo.



Why Heavy Earthwork is Expensive

When a locating engineer doubles the depth of a cutting or the height of a fill, the cost of earthwork mounts up considerably. These diagrams show how the volume of material required to make a 40-foot fill is nearly four times as much needed for a 20-foot filling. Material usually has to be moved farther and this factor also contributes to the high costs of deeper earthwork. Until the advent of the power shovel, earthwork was moved by hand and although the use of machines reduced the cost the ratio remains high.

Railways in Warfare

Railways are superior to any other form of land transportation for bulk movements of supplies and troops over distances greater than about 75 miles. Since the location of railway lines may be of great strategic importance, and because long lines are difficult to construct in war, many countries have laid out their regular transportation systems with a view to employing them in military operations. Railways in rear of the battle line and parallel to it have a distinct value in connection with the rapid movement of troops from one part of the front to another.

Army Field Regulations Manual.

There's Something About a Soldier . .

A Richmond, Fredericksburg & Potomac engineer, George K. Miller, recently took his train into Washington a few minutes early, just to save a couple of soldiers from going A. W. O. L. According to the *Washington Star*, the soldiers boarded RF&P train No. 14 at Richmond at 11:05 a. m. In order to get back to camp they had to catch a 3 o'clock northbound train in Washington, and No. 14 was due in Washington at 3 sharp. They asked if the connection could be made.

The two G. I.'s didn't know what they were asking! No. 14 is seldom on time under wartime conditions, with more coaches to pull, more handling of baggage, and terminals so crowded that trains are held up outside the Washington station. The conductor asked Engineer Miller anyway. Here's the log:

On time at Fredericksburg, halfway mark, at 1:35.

Arrived Quantico, 2 p. m.—on time.

But on the platform were hundreds of marines waiting to board the train; and on the trucks were tons of baggage.

It looked bad for the two soldiers. No. 14 was five minutes late pulling out.

"Let's go," said Engineer Miller to the fireman.

He beat the engine unmercifully. "How she did grunt, groan and wallow," he said later. "But I kept romping on her and she stepped right along."

Arrived Alexandria 2:35—five minutes ahead of time—some ride!

The train crew went into action—mail, express and passengers were loaded in record time. No. 14 left Alexandria on time.

He romped her again in the run to Potomac Bridge—picked up five minutes.

After taking it easy over the bridge he found the stop signal against him, but motioned for the operator to raise the window of the signal house. Engineer Miller shouted, "I've got two soldiers that have to make the 3 o'clock train or they'll be A. W. O. L."

The operator slammed down the window and the signal changed from stop to proceed.

No. 14 went through the tunnel and pulled into the Washington station at 2:58—two minutes ahead of time.

The two soldiers hit the concrete running and made their train.

Courtesy R. W. L. Gladstone, Eastleigh, Hillside Dr., Woolton, Liverpool, England.

Forty-four semaphores decorate this signal gantry on the L&NW at Rugby, England. Only three tracks pass underneath.

It was a great day in railroading when in 1852 Missouri Pacific received its first locomotive delivered by sailing vessel and river boat from New England shops. This was the first locomotive to run west of the Mississippi.

Today Missouri Pacific uses a fleet of high powered General Motors Diesel locomotives to haul long heavy loads of oil and war freight, and to provide swift dependable passenger transportation.

PUTTING RAILROADING ON A NEW PLANE

These days the railroads are doing things that would have been impossible a few years ago. And one of their most powerful and modern tools is the General Motors line of Diesel locomotives.

Since the day that the first of these locomotives took the rails, they have rolled up the impressive total of more than 200 millions of miles of operation on America's major railroads.

In the things they have done—moving tremendous loads, maintaining fast, regular schedules, always on the job—lies the forecast of a new day for railroading when the war is over. Then the *full possibilities* in Diesel motive power may be applied to the carrying of passengers and freight throughout the country.

That is why it's a great new day for railroading, with greater days ahead.

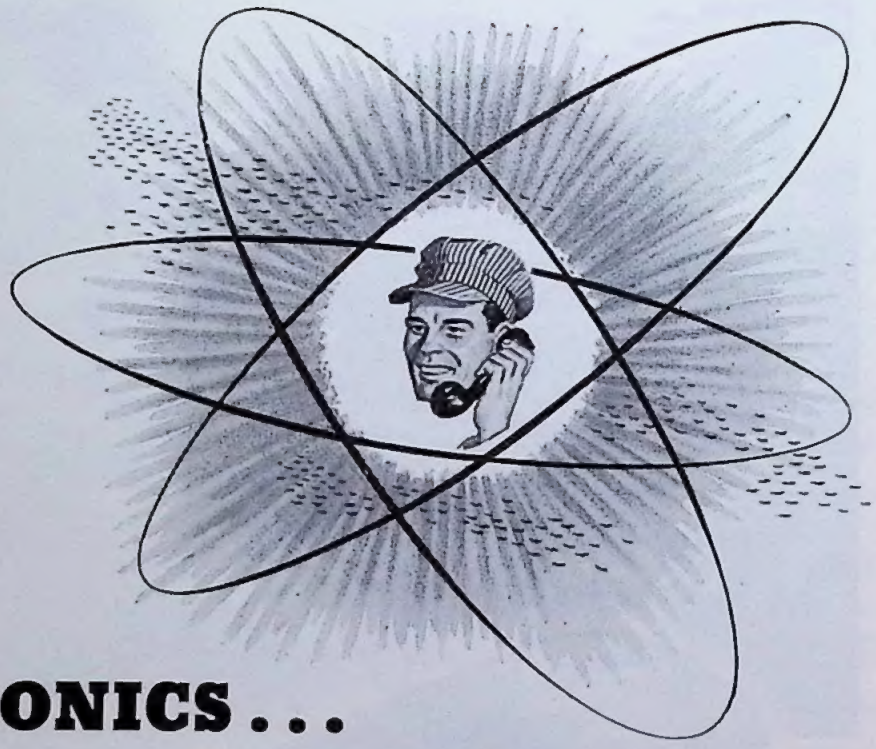
ON TO FINAL VICTORY
BUY MORE WAR BONDS

GM
GENERAL MOTORS
DIESEL POWER

LOCOMOTIVES . . . . . ELECTRO-MOTIVE DIVISION, La Grange, Ill.

ENGINES . . 150 to 2000 H.P. . . CLEVELAND DIESEL ENGINE DIVISION, Cleveland 11, Ohio

ENGINES . . . 15 to 250 H.P. . . . . DETROIT DIESEL ENGINE DIVISION, Detroit 23, Mich.



ELECTRONICS . . .
are workin' on the railroad

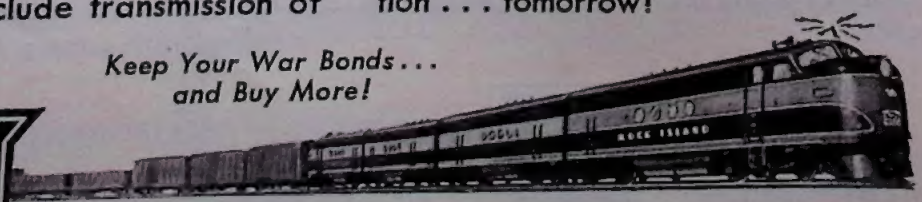
"Train Three-One-One to yardmaster . . . Train Three-One-One to yardmaster . . ." Yes, radio communication has been tested, and it's working on the ROCK ISLAND LINES.

Almost a year ago, ROCK ISLAND *was the first railroad to receive its own permit from the Federal Communications Commission to test radio in connection with the operation of its trains. Regular installations were made, engineer-to-conductor-to-flagman, train-to-yardmaster.*

The ROCK ISLAND LINES *established an Electronics Department. Experiments also include transmission of* written messages in facsimile by radio, induction and radio telephone between engine and caboose and between stations and moving trains, portable short-wave radios that automatically bridge gaps in storm-damaged communication lines . . . and microwave-radar developments.

This is another practical example of the working of ROCK ISLAND LINES' Program of Planned Progress. *Yesterday's* planning provided a war-ready transportation system which is doing its wartime job with notable efficiency. *Today's* planning will provide finer, safer, swifter transportation . . . tomorrow!

Keep Your War Bonds . . . and Buy More!



Rock Island

ROCK ISLAND LINES

ONE OF AMERICA'S RAILROADS—*ALL* UNITED FOR VICTORY

Correspondence

In the February 1945 Trains, page 12 carries a drawing of a train at an Italian railway station. A large sign at the upper right reads "Uscita" which the caption would lead one to believe is the name of the station. In reality, it is the Italian word for Exit and merely is intended to indicate the way out!

S. G. Morley, 2635 Etna St., Berkeley 4, Calif.

(To Mr. Morley and all other discerning readers we will attempt to prove we *do* know our Italian by saying *la faccia nostra e rossa*, and believe us, it has seldom been redder.—*Ed.*]

According to a German travel folder of 1936 vintage, the German railroads were the largest individual employer of labor in the world, having in their service about 600,000 working men and officials. They had about 33,500 miles of track in operation. Rolling stock consisted of 22,000 locos, 61,300 passenger cars, 622,400 freight cars and 20,800 baggage cars. The system had 12,100 stations, 2,112 water works, 65 electric power stations, and eight gas works. They also had a flyer running between Berlin and Hamburg called the *Flying Hamburger* which was supposed to be the fastest train in the world, covering 179 miles at an average speed of 78 miles on hour. Even in this folder one could see the influence of Adolf and his gang.

Harvey Hajry, 1658 N. 145th St., Seattle 33, Wash.

The world's first sleeping car was built in Brantford, Ontario, according to a recent article in The Brantford Expositor. This car was built by the Buffalo & Lake Huron Railway Co. in its Brantford shops in 1859 for the Prince of Wales (afterwards King Edward VII) to travel in when he toured Canada in 1860. It was painted royal blue on the outside and was fitted with lounges, chairs and marble slab tables, silk straw-colored blinds with spring rollers, and carpets, as well as bunks for sleeping purposes. It was 40 feet long and fitted with brass hand railings. George M. Pullman, then engaged in moving and raising small frame railway depots in this section of Canada, was an interested visitor in the Brantford shops at the time, and it was in the same year that he evolved his first sleeping car.

R. S. Williamson, P.O. Box 238, Brantford, Can.

Who's right? February 1945 TRAINS says, "The Cumberland Valley Railroad operated the first sleeping cars in the world over its tracks between Harrisburg and Chambersburg."—*Ed.*]

A Canadian road of great interest and traveled by many Americans since the war started is the joint CNR-CPR Northern Alberta Railway, which runs from Edmonton to Dawson Creek and Waterways. It is very odd to see a Northern Alberta Railway light-blue wooden sleeper coupled to a green CNR steel sleeper and a red CPR steel diner—all behind a CPR locomotive.

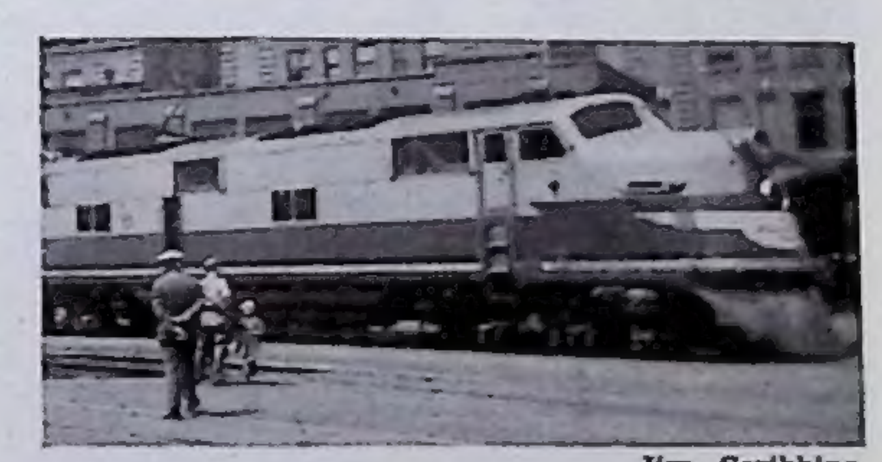
A. Johnston, 990 Chevrier Blvd., Ft. Garry, Manitoba, Can.

Answers to quiz, page 34

1, CMStP&P, DSS&A. 2, StL-SF, MKT. 3, Pennsylvania, Southern, WPt, L&N. 4, CB&Q, GN. 5, IC, Central of Georgia, ACL, FEC. 6, C&NW, UP, SP. 7, Pennsylvania, NYNH&H, CVt, CNR. 8, MoPac, T&P. 9, NYNH&H, B&M, Maine Central. 10, KCS, L&A. 11, Pennsylvania, L&N, Central of Georgia, ACL. 12, NYC, Rutland, CNR. 13, Pennsylvania, Southern, N&W, Southern. 14, CB&Q, NP. 15, C&EI, L&N, NC&StL, AB&C, ACL, FEC. 16, CBQ, D&RGW, WP. 17, B&M, Maine Central. 18, StL-SF, Southern. 19, CB&Q, CRI&P. 20, NYC, D&H, CPR.

Loco Obsession

A surprise for us! Jim Scribbins, 1609-A W. Center St., Milwaukee, who had never met A. C. Kalmbach, editor of TRAINS, was in the office one day showing some of his photos to Research Editor Joe O'Hearn when Joe scooped up a photo and ran into A. C.'s office. "Know these people?" he asked, showing the view of Milwaukee Road No. 6 in Milwaukee station from which this portion is taken.



Jim Scribbins.

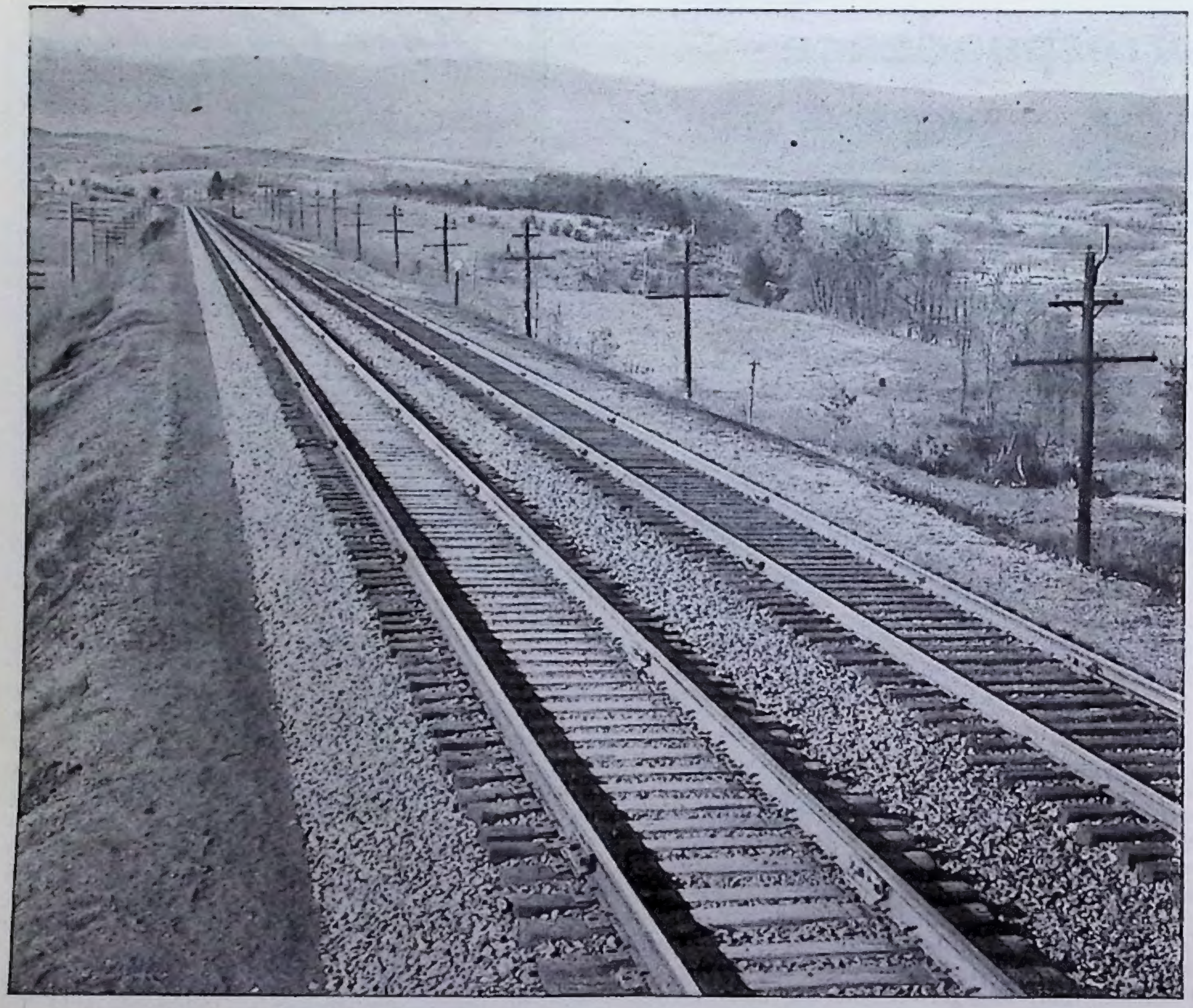
They were recognized immediately for the man in shirt sleeves is Al Kalmbach, the girl his daughter Kathryn, and the other man M. F. Kalmbach, Al's father. Another daughter, Elizabeth, is behind her dad. The photo was taken a couple of years ago, which explains the absence of son Charles, now 3 and the devoutest railfan of the whole Kalmbach family. Al says it isn't surprising that his gang should sooner or later turn up in a photo taken at one of the Milwaukee stations for they practically have squatters' rights.

Speaking of squatters' rights brings to mind another incident involving avid rail fans. Joe and Nila O'Hearn boarded a Port Washington interurban at the Milwaukee Electric Lines' depot. They entered through the motorman's cab door and took the front seat. Then Joe noticed three gentlemen bearing down upon them with that certain look in their eyes peculiar to rail fans throughout the world. It turned out that the three were rail fans from Indianapolis, headed by Richard I. Nation. In the ensuing discussion it was arranged for the O'Hearns to keep the seat up to the Port and to relinquish it to the Nation group on the return trip. All this resulted in a beautiful friendship between those involved.

More than ever we must cut down unnecessary travel. The need for Pullman cars increases in direct proportion to the number of returning wounded service men. They must be cared for. The only way to do it is to see to it that the required space is available at the time and place needed. It may be nice to travel, but it's much better to know that if you don't some wounded serviceman is getting home, or to a hospital, in the Pullman space you gave up for him.

Kalmbach Publishing Co.

1027 N. 7th St. Milwaukee 3, Wis.



WORLD'S BUSIEST HIGHWAY

Over such highways — 230,000 miles of them — more freight and passengers are moving today than ever moved before anywhere on earth by any means of transport. • In 1944, the railroads hauled nearly three times as much inter-city freight, and nine times as much war freight, as all other carriers combined. • That is one of the great lessons to come out of the war — what modern American railroads can do. • And one of the things to remember after the war is won is that in peacetime, too, America needs and must have the kind of transportation which only its railroads can deliver.

BUY MORE WAR BONDS

ASSOCIATION OF
AMERICAN RAILROADS
All United for Victory